

THEY SHALL BE NEITHER EARLY NOR LATE:
A STUDY OF THE TIME RECKONING SYSTEM IN THE QUMRAN CALENDRIAL
DOCUMENTS

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DOCTOR OF PHILOSOPHY
THE UNIVERSITY OF EDINBURGH
2001



For Connie
my beloved wife

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ABSTRACT

The study of the calendar has always been one of the key subjects in Qumran research. Eighteen Qumran manuscripts devoted solely to the calendar constitute an indispensable source of material for probing this important topic. The aim of this thesis is to analyse a basic but vital aspect of the calendrical data in these Qumran Calendrical Documents: their system of time reckoning. The research of the thesis consists of two stages with different objectives. The first stage of textual study aims to provide a comprehensive and reliable reading for each document concerned. The second stage targets producing a well-evidenced perception of the time reckoning system in these documents. The aim of the initial stage is achieved by a detailed fragment by fragment study of each manuscript, comparing the best available readings with the photographs of the original fragments. The results form the requisite foundation for the subsequent analytical work. The target of the succeeding stage is accomplished by investigating three independent but interrelated areas of time reckoning. The investigation of the structure of the calendar confirms that all the Calendrical Documents agree on only one single calendrical structure that has 364 days a year, a fourth day of the week beginning for every year, and an identical quarterly structure of 30-30-31-day months. The analysis of the lunar material of these documents shows that they reckon the lunar cycle with a highly schematic model which is best represented by the formula: $364 \text{ days} \times 3 = 18 \times 29 \text{ days} + 18 \times 30 \text{ days} + 29 \text{ days} + 1 \text{ day}$. The lunar cycle only functions as the object of enumeration but never as the regulator of the calendar in these texts. The search on the question of intercalation proves that there is no evidence in these documents that the calendar was ever intercalated to match the true solar cycle. The only scroll which is thought to provide the intercalary scheme turns out to be evidence for the non-intercalary nature of the calendar in these scrolls. The three perspectives of this analysis produce a picture of the Qumran Calendrical Documents' calendar as highly schematic and regular with every day firmly fixed in a well-formed structure without variance for even a single day.

PREFACE

This study of the Qumran calendar has grown out of a fascination with the Dead Sea Scrolls and their profound influence on the understanding of both Judaism and Christianity. I was first introduced to the wonderful world of the Qumran Scrolls through Dr Timothy H. Lim's course on "The Dead Sea Scrolls and Christian Origins" in the final year of my BD study. It is difficult to thank Dr Lim, my mentor in Qumran Study and the first supervisor of my thesis, enough for his encouragement and support in many and various ways. He first initiated my interest in studying the Qumran calendar, challenged me with critical questions, and shared his keen insights throughout the evolution of this thesis. I am deeply grateful not only for his scholarly guidance, but for his great generosity and warm friendship. I am also enormously grateful to Dr Peter Hayman who is my first teacher of the Hebrew Bible at New College. I owe him thanks for instilling in me an appreciation for the profound and the beauty within the Hebrew language. I wish also to thank Professor Shemaryahu Talmon of the Hebrew University for his kind advice on the references of his vital publications on the related subject and on the progress of the *editio princeps* of the Qumran Calendrical Documents.

My years of study in Edinburgh were funded by the University of Edinburgh, Faculty of Divinity Scholarship, as well as financially supported by my own church in Hong Kong, the Hung-En Lutheran Church. To the pertinent committees of the funding bodies I set down my heartfelt gratitude.

During this thesis many of my friends have supported me in ways that they possibly are not even aware of. Some have showed love, interest and encouragement that has meant a great deal to me; others have shaped my thinking in important ways. I can mention here only Stephen Lee, Craig Ho, Luke and Helen Cheung, Chak-poh and Wai-hang Cheung, Michael and Agnes Hui, Joseph and Lee-tzu Teng, and Bobby Chum. I have also been greatly blessed by the constant fellowship with the Chinese Evangelical Church in Edinburgh. The loving and caring friendship of the church members has always

been my source of energy and comfort. In the process of preparing this dissertation for submission, Jacqueline Armstrong has been a skilful proof-reader, and I thank her for her enthusiasm and warmth and for all the ways in which her suggestions have improved the thesis.

Most of all, I give my deepest thanks and love to my wife Connie. My research could not possibly be completed without her support. She has sacrificed six years of her career to facilitate my study in Edinburgh. Her silent endurance to make our ends meet in these years of course is indispensable for the accomplishment of this thesis, but far more important to make the dream come true is her unfading love and encouragement which is the ultimate source of strength that keeps me going throughout the whole journey of my study. I therefore wholeheartedly dedicate this thesis to her.

I hereby now also declare that the thesis has been composed by myself and is the result of my own research.

Heng-kei Se

KEY TO SYMBOLS

[]	lacuna
[⸮⸮⸮]	missing text reconstructed in the lacuna
[?⸮]	reconstructed text in doubt
<i>vacat</i>	blank space
{ }	scribal erasure or correction
< >	superlinear text
•	illegible traces of a letter
⸮ ^o	damaged letter, reading uncertain
⸮	damaged letter, reading certain

CHAPTER 1

INTRODUCTION

The Qumran calendar remains a challenge at the forefront of Dead Sea Scrolls research fifty years after their discovery. At the exquisite occasion of a formal dinner banquet, under flood-lighted limestone cliffs and fire torches, at the archeological site of Khirbet Qumran in the Judean Desert, Hartmut Stegemann, a veteran Scrolls scholar, presented the closing paper of the conference celebrating the fiftieth anniversary of the discovery of the Dead Sea Scrolls by putting forward his visionary idea about the future of the scrolls' research. The calendar was one of the main challenges he laid before Qumran scholars and students gathered from all over the world. This thesis is meant to be a response to this call, a probe into this vast and complicated subject, and is an attempt to form a piece that can be fitted into the large puzzle of the "Qumran calendar".

From the very beginning of the Qumran discovery the calendar has played an important role in the study of the scrolls. This is reflected in both widespread interest in the subject across the different levels of the study and the many heated debates on the topic. It occupies a section in nearly every general introductory book on the scrolls. At the same time it is carefully studied and discussed among experts and leading scholars of the field. This scholarly concern is best illustrated in the series *Discoveries in the Judean Desert*,¹ the official publication on the scrolls. The calendar is going to occupy a complete volume out of the anticipated total of thirty-nine. Time-wise, as early as in 1951, only four years after the first lot of scrolls were found in the caves of the Judean Desert, calendar and calendrical controversy had already been put on the agenda of discussion in Qumran studies.² For some fifty years, the intensity of interest in the subject has subsided only occasionally.

On one hand this extensively discussed and interesting topic seems to be

¹ Published by the Oxford University Press.

² The issue was raised by Talmon in his article on *Pesher Habakkuk*, "Yom Hakkippurim in the Habakkuk Scroll," *Biblica* 32 (1951) 549-563.

widely known by anyone who has ever been in contact with the field of Qumran scholarship, but on the other hand it remains perplexing and puzzling to many people. Studying an ancient calendar is never an easy task. It involves monotonous tables and statements, handling numbers and figures, and dealing with formulas and equations which deter most people from wanting to have direct hands-on experience of the subject. Instead, they rather rely on the works of the experts. Furthermore, the complexity of related issues surrounding the topic of calendar forms another factor that puts people off from grasping a solid understanding of the subject. A brief review of the progress of research will demonstrate on one hand the complexity of studying the Qumran calendar, and on the other hand what scholars have achieved so far in this difficult subject. The review undertaken in the following pages is presented not in a chronological order but according to the influential contributors on the topic with their major publications and area of concern.

REVIEW ON RESEARCH SCHOLARSHIP

Jaubert

Not being specifically a Qumran scholar, Annie Jaubert's prime concern with the calendar was in resolving the problem of dating the Last Supper in the New Testament Gospels. As she put it "the date of the Last Supper is linked with the problem of the day of Jesus' death, a question which has occupied exegetes since the end of the second century."³ The solution she proposed to resolve the discrepancy between the description in the Gospel of John and the synoptic Gospels was that their authors were using two different calendars. As a by-product to her main thesis, she put forward a theory that has had profound influence not only among New Testament scholarship but also in the wider circle of Old Testament and Pseudepigrapha studies.

³ A. Jaubert, *The Date of the Last Supper* (trans. I. Rafferty, Staten Island, New York: Alba House, 1965) 9.

She touched on an age-old problem in the Hebrew Scriptures: What calendar did the ancient Israelites and Jews use when they wrote their sacred books? Since its publication Jaubert's theory has become the focus of the discussion on the ancient Jewish calendar, and at some stages it has even dominated the view on the understanding of the Old Testament calendar. Its influence can still be felt today.

Jaubert built up her thesis in a series of articles from 1953 to 1957, and eventually brought them together in a book called *La date de la cène*,⁴ which was translated into English in 1965 as *The Date of the Last Supper*.⁵ At the time when she worked on her thesis none of the Qumran texts in connection with the calendar had been published, so the sources of material for Jaubert were the *Book of Jubilees* and the Hebrew Bible. However, the information supplied by one of the scroll editors, Józef Milik, allowed Jaubert to draw the relationship between the calendar of *Jubilees* with the one at Qumran. She noted that "the very recent discovery of a fragmentary liturgical calendar on the site of Cave IV identifies definitively the calendar of *Jubilees* and that of the [Qumran] sect."⁶ Her intention in this study of the calendar of *Jubilees* can be summarised into two main points: firstly, to consolidate an overall structure for the calendar, and secondly, to demonstrate that it is the underlying calendar for the priestly writings of the Hebrew Bible.

Long before the discovery of the scrolls, a calendar of 364 days a year was already known in the Ethiopic version of the Pseudepigrapha, *I Enoch* and *Jubilees*. The find is a peculiar one in itself for no other calendar in the ancient world reckoned the length of the year as such. Yet, no detailed study on the precise arrangement of days and months in this calendar was made until Jaubert. The particular number of days in a year is in an exact multiple of seven, so each year contains an exact number

⁴ A. Jaubert, "Le calendrier des Jubilés et de la secte de Qumrân: Ses origines bibliques," *Vetus Testamentum* 3 (1953) 250-264; "La date de la dernière cène," *Revue de l'Histoire des Religions* 146 (1954) 140-173; "Le calendrier des Jubilés et les jours liturgiques de la semaine," *Vetus Testamentum* 7 (1957) 35-61; *La date de la cène: calendrier biblique et liturgie chrétienne* (Paris: Gabalda, 1957).

⁵ Jaubert, *The Date of the Last Supper*.

⁶ Jaubert, *The Date of the Last Supper*, 17.

of fifty-two weeks, which can also be further divided into four equal quarters each of exactly thirteen weeks. This “magic” number, 364, makes the calendar a perfect system when operating with the cycle of weeks for by this the day of the year would fall exactly on the same weekday year in and year out. Hence, the question occupying Jaubert when thinking about the structure of the calendar was how to match the year-days with the weekdays. The starting point for Jaubert was to look at the problem of the date of the Festival of Weeks. By counting the days between the Waving of Omer and the Festival of the Weeks, and following the line of thought of Barthélemy, Jaubert reached the conclusion that the *Jubilees* calendar began its year on a Wednesday.⁷ To further support this conclusion Jaubert carried out another test, that is by analysing the dates of travelling done by the patriarchs as recorded in *Jubilees*. She managed to find out that there is only one day in the week when no journey is recorded which, she concluded, had to be the Sabbath. By this she arrived at the same result as the first investigation - that in *Jubilees* the New Year Day is on a Wednesday. With this conclusion Jaubert was able to present the details of the calendar in a simple quarter-year table:

	Month														
Weekday	I. IV. VII. X.					II. V. VIII. XI.					III. VI. IX. XII.				
Wednesday	1	8	15	22	29		6	13	20	27		4	11	18	25
Thursday	2	9	16	23	30		7	14	21	28		5	12	19	26
Friday	3	10	17	24		1	8	15	22	29		6	13	20	27
Saturday	4	11	18	25		2	9	16	23	30		7	14	21	28
Sunday	5	12	19	26		3	10	17	24		1	8	15	22	29
Monday	6	13	20	27		4	11	18	25		2	9	16	23	30
Tuesday	7	14	21	28		5	12	19	26		3	10	17	24	31

Moreover, Jaubert’s analysis of the *Jubilees* calendrical data did not stop at this point. She continued to look at the other dates in the book, and reached another conclusion which was crucial for her theory about the biblical calendar - the *Jubilees*’ calendar highlights certain weekdays, Wednesday, Friday, and Sunday, as having special

⁷ Jaubert, *The Date of the Last Supper*, 23-25.

liturgical significance.⁸ Then by extending the same test, that is, collecting the recorded dates and finding out their corresponding day of the week according to the *Jubilees*' calendar, with that of the books in the Hebrew Bible, she made a remarkable discovery:

In conclusion, after examination of the priestly texts, with which Jubilees, the Writing of Damascus, and the documents of Qumran present such remarkable affinities, the harmony as regards the calendar is too striking to permit rejection of the evidence supplied by the texts themselves that they preserve an ancient calendar of Israel.⁹

The implication of Jaubert's concluding statement on the Qumran calendar possesses two important claims: firstly, it is the same calendar as the one in the priestly writings of the Hebrew Bible; secondly, it was an ancient calendar of Israel. To Jaubert this may be only a stepping stone to reach her final goal, but to those who study the Qumran or Hebrew Bible calendar her theory was not just a small stone that caused a few ripples but rather was a bombshell that shaped the course of subsequent studies.

Milik

Among the small team of original editors, Józef T. Milik was the one who had been assigned the task of handling all the calendrical texts, a comparatively small job among the massive amount of fragments of manuscripts allocated to him. As the official editor of these documents, Milik had the privilege of releasing insider information about the Qumran calendar. In his report to the Strasbourg Congress in

⁸ Jaubert's theory about the liturgical dates has been seriously challenged by many of her critics, such as T. H. Lim, "The Chronology of the Flood Story in a Qumran Text (4Q252)," *Journal of Jewish Studies* 43 (1992) 288-298; J. M. Baumgarten, "The Calendar of the Book of Jubilees and the Bible," *Studies of Qumran Law* (Leiden: Brill, 1977) 101-114; J. C. VanderKam, "The Origin, Character, and Early History of the 364-Day Calendar: A Reassessment of Jaubert's Hypotheses," *Catholic Biblical Quarterly* 41 (1979) 390-411.

⁹ Jaubert, *The Date of the Last Supper*, 38.

1956,¹⁰ he announced that in a group of manuscripts, which he gave the title “Mishmarot”, he had been able to identify a calendar which was the same as the one in *Jubilees*. Then in the same report he provided several further details of this calendar which went beyond the evidence supplied in the previously known resources. Many of these details were restated in a more detailed and organised form in his introductory book on the scrolls.¹¹ The additional information about the Qumran calendar supplied by Milik at this stage can be grouped into the following main points:

- The hypothetical structure suggested by Jaubert can be substantiated by the Mishmarot manuscripts found in Cave IV.
- The weekly rotation of the priestly duty in the Temple forms an important part of these manuscripts. This duty roster is integrated into the 364-day calendar in a six-year cycle. The number of priestly families involved in this duty accords with the record in 1 Chr 24 and totals twenty-four. The manuscripts also agree with the tradition that each duty lasts for one whole week and starts on the sabbath. In order for the same priestly family to come back on duty at the same time of the year, six years would have lapsed ($364 \times 6 = 24 \times 91 = 24 \times 7 \times 13$), and in this period the number of duties for each family is thirteen.
- In these manuscripts, there exists another calendar, a luni-solar one, which has twelve months of alternating twenty-nine and thirty days for three years and an intercalary month of thirty days at the interval of each three-year period. This luni-solar calendar is synchronised with the 364-day one every three years ($364 \times 3 = [29 \times 6 + 30 \times 6] \times 3 + 30$).
- Some of the works among the Mishmarot texts are the synchronism of the three systems: the priestly rotation, the 364-day calendar, and the luni-solar calendar.
- Some texts contain feasts and festivals marked by the priestly rotations. The festive cycle identified in these texts does not only contain the principal biblical festivals but also some other extra holidays, such as the first of each new season (1/1, 1/4,

¹⁰ J. T. Milik, “Le travail d’édition des manuscrits du désert de Juda,” *Volume du Congrès Strasbourg 1956* (Supplements to Vetus Testamentum 4; Leiden: Brill, 1957) 17-26.

¹¹ J. T. Milik, *Ten Years of Discovery in the Wilderness of Judaea* (London: SCM, 1959) 107-113. The book was first published in French in 1957, and was then published in English in 1959.

1/7, 1/10, which are also called the Day of Remembrance) and the Feast of Oil (22/6).

- Some of these texts while recounting the sabbaths and the beginning of the months also commemorate some historical events and incorporate months with Babylonian names.

After giving the account of this new information, two questions were raised by Milik about the Qumran calendar: Where did it originate? How was it synchronised with the astronomical year? To answer the first question, Milik basically accepted Jaubert's idea that this calendar is behind the biblical books. However, when it comes to the question of whether it was actually used in the Temple, his conclusion was only a *non liquet* with a slight tendency towards its favour. To answer the second question, while accepting that there is no evidence with which to solve the problem, Milik still favoured the presence of co-ordination between the two, and suggested a hypothetical solution based on intercalating the 364-day year by inserting a 29-day month in every twenty-four years.

In the additional notes at the end of the book, Milik produced another preliminary idea about the calendar from the unpublished Mishmarot texts which was controversial in its own right. In the additional note 5, he related: "Further study of the Mishmarot from Cave IV, not yet finished, seems to favour the assumption that the Essenes computed the beginning of their lunar month from the full moon, not the new moon."¹² This suggestion stands in sharp contrast to other Jewish traditions.

While many were waiting for his publication of the Mishmarot texts to verify all his intriguing ideas, in 1976 Milik produced even more new information about the Qumran calendar in his renowned study on the Aramaic fragments of the *Books of Enoch* from Cave IV. In searching for connection between the *Astronomical Book of Enoch* and the Qumran scrolls, Milik cited partial readings from two otherwise unknown texts of Qumran Cave IV injecting further novel elements to the debate over the Qumran calendar. A text, which Milik preferred to call *ha-Otot*, employing the sexennial priestly cycle as the base of its enumeration provides evidence of a cycle of

¹² Milik, *Ten Years of Discovery*, 152.

much longer period than any other previously known cycles within the calendar - a cycle of six jubilees ($6 \times 49 = 294$ years).¹³ His work on another cryptic text revealed that the Qumran calendar employs a method similar to the *Astronomical Book* in calculating the phases of the moon in fourteen steps.

Despite the fact that Milik has never managed to publish the Mishmarot texts, he has given researchers a fairly comprehensive picture of what the unpublished documents tell us about the Qumran calendar. In the absence of the source material for evaluating the interpretations and suggestions made by Milik, researchers in this area were forced to accept the situation and had to rely on his words to further their investigation, a situation which lasted for almost forty years.

Talmon

Succeeding Milik as the editor of most of the Qumran calendrical texts is Shemaryahu Talmon, but his interest in the calendar did not begin with his appointment. In fact, Talmon is among the earliest scholars who was interested in the calendar and its place within the study of the scrolls and their related community. As early as 1951, in his study on the *Pesher Habakkuk*, Talmon has already underscored the calendar as the key to understanding the separation of the scrolls' community from Second Temple Judaism. The key passage which drew Talmon's attention in this aspect is 1QpHab 11.4-8, a commentary on Hab 2:15,

Its interpretation concerns the Wicked Priest who pursued the Teacher of Righteousness to consume him with the heat of his anger in the place of his banishment. In festival time, during the rest of the day of Atonement, he appeared to them, to consume them and make them fall on the day of fasting, the sabbath of their rest.¹⁴

¹³ J. T. Milik, (ed.), *The Book of Enoch, Aramaic Fragments of Qumran Cave 4* (Oxford: Clarendon, 1976) 62-65. Milik took the text to cover seven jubilees, but remarked that the cycle only takes six jubilees to complete.

¹⁴ Translations of the Qumran Scrolls come from F. García Martínez and E. J. C. Tigchelaar,

By rejecting Dupont-Sommer's view that the passage referred to the conquering of Jerusalem by Pompey in 63 BCE, Talmon urged that it should be understood as reflecting the difference in calendrical reckoning.¹⁵ The passage states that while the Teacher of Righteousness and his adherents were observing the Day of Atonement in a place of their choice, the Wicked Priest and his followers came to disturb their religious duty and "consume" them. Talmon noticed that the Wicket Priest seemed not to feel obligated to observe the holy day as the Teacher of Righteousness was. It is hard to explain why the Wicked Priest could take such an action unless he was not a Jew. This is especially true when the Wicked Priest is usually understood to be no ordinary Jew but a high-ranking priest, probably a high priest, a leader of the official authority of the Temple. It is doubly hard to imagine that a high priest would defile the holiest day of the year and forsake his heavy duty in the Temple on that day to pursue his enemy to his hiding place. The only possible explanation, Talmon deduced, was that the day honoured by the Teacher was not regarded as binding for the Priest. By following two different calendars in regulating their festivals, they arrived at different days for the Day of Atonement. This day of pursuing was a holy day for the Teacher but not for the Priest. The conclusion made by Talmon: "The 'New Covenanters' deviated from official Jewry not merely by certain spiritual and legal divergencies but also by the employment of a different calendar calculation"¹⁶ has ever since become one of the standard perceptions about the Qumran community. At the time when none of the calendrical material from Qumran had been released, it was remarkable that Talmon could reach such an insightful yet justifiable statement about the community. His idea also became the driving force behind the calendar becoming one of the indispensable items on the research agenda.

Since his 1951 article, calendrical dispute has become the central theme in Talmon's subsequent studies on the Qumran calendar, but he has also introduced

(eds.), *The Dead Sea Scrolls Study Edition* (2 vols, Leiden: Brill, 1997-8), unless otherwise indicated.

¹⁵ Talmon, "Yom Hakkippurim," 550.

¹⁶ Talmon, "Yom Hakkippurim," 563.

other aspects of the calendar. His comprehensive study on the calendar in 1958 brought another intriguing and controversial dimension to the study.¹⁷ While asking the question of how different the Qumran calendar was from the current Jewish calendar, Talmon searched for the answer from both the writings of the scrolls and rabbinic literature, and concluded:

The linking of the Sabbath with the festivals in the 'Calendar dispute', both in the writings of the מקראות and of the sages, furnishes us with evidence for the hypothesis that the Covenanters differed from normative Judaism on two main principles: a) in the calculation of the year, employing respectively the solar period and the course of the moon as basis of their computations, and b) in the method of reckoning the day, from sunrise or from sunset.¹⁸

The first point he made is not very significant. Although the 364-day year of the Qumran calendar does not match the actual solar period it still calculates the year by the sun. While the identity of the calendar used by the wider Jewish public in the last two centuries before the turn of the era is still debatable, retrojecting the Jewish luni-solar calendar known from the rabbinic literature onto this period is widely perceived as a probable solution. The ruling principle for such a calendar is undoubtedly the course of the moon. So it is possible to see that the controversy over the calendar was a struggle for supremacy between the two ruling principles in calendar design - the circuit of the sun and of the moon.

The second hypothesis proposed by Talmon in the concluding statement provides the real excitement. Although reckoning the beginning of the day with the sunrise is not unheard of in the ancient calendars, it has never been tied up with Jewish reckoning. If the Qumran community really reckoned the day in such a way, they would be acting contrary to most other Jews. This dramatic claim of Talmon

¹⁷ S. Talmon, "Calendar Reckoning of the Sect from the Judaean Desert," in C. Rabin and Y. Yadin (ed.), *Aspects of the Dead Sea Scrolls* (Scripta Hierosolymitana 4; Jerusalem: Magnes, 1958) 162-199.

¹⁸ Talmon, "Calendar Reckoning," 194.

became another controversial point about the Qumran calendar which drew frenzied responses, both supporting and rejecting, from other scholars.

While the *DJD* edition of the calendrical texts is under preparation, Talmon has published three articles covering three different manuscripts, one by himself and the other two under joint authorship with Israel Knohl.¹⁹ The two jointly published articles are both on a text designated as Mishmarot B (4Q321 - Mishmarot B^a, and 4Q321a - Mishmarot B^b). The conclusion drawn at the end of these studies on the function of the text provided another important view held by Talmon on the Qumran calendar - his understanding of the scrolls' attitude towards lunar reckoning. It is expressed clearly in the abstract of one of these studies:

It should be stressed that calendrical documents like the one published here are not intended to provide overall 'synchronization tables' between the solar and the lunar year, as is sometimes maintained. Rather, the specification of the moon's monthly 'dark' phases and their equivalent dates in the solar calendar are intended to provide the *yahad* members with a means for avoiding, to the best of their ability, the 'negative' dates in the moon's revolution that spell evil and potential disaster.²⁰

The hostility towards regulating the calendar according to the observation of the moon is prominent in *Jubilees*. However, the lunar cycle also has a part in the chronological systems of the *Astronomical Book of Enoch*. So even before the

¹⁹ S. Talmon, "A Calendrical Document from Qumran Cave 4 (mišmarot D, 4Q325)," in Z. Zevit, S. Gitin, and M. Sokoloff (ed.), *Solving Riddles and Untying Knots: Biblical, Epigraphic, and Semitic Studies in Honor of Jonas C. Greenfield* (Winona Lake, Indiana: Eisenbrauns, 1995) 327-344; S. Talmon and I. Knohl, "A Calendrical Scroll from a Qumran Cave: Mišmarot B^a, 4Q321," in D. P. Wright, D. N. Freedman, and A. Hurvitz (ed.), *Pomegranates and Golden Bells: Studies in Biblical, Jewish, and Near Eastern Ritual, Law, and Literature in Honor of Jacob Milgrom* (Winona Lake, Indiana: Eisenbrauns, 1995) 267-301; "A Calendarical Scroll from Qumran Cave 4: Mišmarot B^b (4Q321a)," in M. V. Fox, et al. (ed.), *Texts, Temples, and Traditions* (Winona Lake, Indiana: Eisenbrauns, 1996) Hebrew 65*-71*, English abstract 409.

²⁰ Talmon and Knohl, "Mišmarot B^b (4Q321a)," 409.

Qumran discovery, the debate on how the adherent of the 364-day calendar perceived the lunar cycle had already been carrying on for quite some time. The controversial point is whether they rejected all kinds of lunar reckoning outright or whether they accommodated certain ways of observing the moon whilst at the same time upholding their particular calendar. The Qumran scrolls reveal that the moon cycle is not totally ignored in the calendrical texts. Although the moon is taken into account in the Mishmarot B, Talmon and Knohl see that its function is for the members of the community to be aware of the dark days of evil. Hence the moon's inclusion remains in a negative sense. So according to Talmon and Knohl's understanding these calendrical texts are concomitant to the rejection of the lunar calendar, an attitude consistent with *Jubilees*. This interpretation, although still subject to evaluation, highlights the attempts of researchers to resolve an enduring problem of the Qumran calendar - what is the role of the lunar cycle in this calendrical system?

Yadin

Another scholar who did not set his interest solely on the Qumran calendar yet produced great impact on its study is Yigael Yadin. An expert in both archaeology and antiquities, Yadin was a prolific writer. Among all his books the one with particular interest to the present review is his monumental study on the Temple Scroll.²¹ The scroll, acquired by Yadin from an antiquities dealer in 1967, turned out to be the longest of all the scrolls from Qumran, a total of sixty-eight columns extending to a length of some twenty-eight feet. It constitutes a detailed architectural blueprint for a vast temple complex to be built in the future. The book starts from the innermost part of the temple, moving outwards. In the section dealing with the construction of the altar and its surrounding area, it detours from the building project to the rites that will be conducted in this magnificent temple on its completion. A considerable portion of the book, almost one fourth of the entire scroll, is devoted to describing in detail what feasts and festivals shall be observed, and when and how they

²¹ Y. Yadin, *The Temple Scroll* (3 vols., Jerusalem: Israel Exploration Society, 1983).

shall be celebrated. It is clear that to its author celebrating these festivals at the right time and in the right manner is equally important as having a correctly built temple.

Before the multi-column section on individual festivals a few lines, badly damaged but carefully reconstructed by Yadin, list the festivals and provide a useful overview of what is to be followed:

9. [And you shall sacrifice on the altar of the burnt offering on all the appointed feasts of the Lord:] on the sabbaths and on the beginnings of 10. [the months and on the first of the first month and on passover] and on the feast(?) of unleavened bread and on the day of waving the sheaf 11. [and on the second passover(?) and on the feast of weeks, which is the feast of] the first fruits for the wheat offering, 12. [and on the feast of the first fruits of wine, when you offer new wine(?),] and on the feast of the first fruits of oil(?) and on the six days of 13. [the wood offering and on the day of memorial and on the day of atonement and on the feast of booths and on the convocation]²²

Most of the holy days on the list are no surprise for they are well documented in the Hebrew Bible and kept by the Jews for generations. The additions, naturally the point of interest for many who study the Temple Scroll, are the extra firstfruit festivals and the appointed time for wood offering. The scroll sets the four firstfruit festivals in a pentacontad series, separating each other in a forty-nine-day span.

1. Firstfruits of barley = Waving of Omer
2. Firstfruits of wheat = Festival of Weeks
3. Firstfruits of wine
4. Firstfruits of oil

The second one is the only firstfruit festival mentioned in the Hebrew Bible. The first one is a known biblical holiday but it is not connected with firstfruit offering. The other two are innovations without previous attestation in the Jewish annual festive cycle.

In the related sections of these festivals the scroll only specifies their relative

²² Yadin, *The Temple Scroll*, v. 2, 319.

periods but provides no absolute dates. In an attempt to determine the absolute dates of these festivals Yadin established the connection between the Qumran calendar and the Temple Scroll. By resorting to the information provided by Milik in his preliminary report, Yadin found the missing link for his solution. Milik reported that an unpublished tiny fragment, 4Q327, reads: “Le vingt deux (du 6^e mois), c’est la fête de l’Huile”.²³ With this information Yadin worked out the dates for the other three festivals: firstfruit of barley (Omer) - 26/1, firstfruit of wheat (Weeks) - 15/5, and firstfruit of wine - 3/5. The dates for Omer and Weeks match with the result reached by other scholars in their struggle with the data from *Jubilees*.²⁴ By this Yadin concluded: “Indeed, we now possess the missing links, which not only prove that the calendar of the scroll is that of the sect, but also confirm the conclusions of scholars who have wrestled with the problems of the calendar.”²⁵ Yadin’s work on the festivals of the Temple Scroll opened up a new dimension for the study of the Qumran calendar - it does not only have its particular way of fixing the days and the months but probably also possesses a unique form of festive cycle.

Wacholder

Ben Zion Wacholder’s contribution to the study of the Qumran calendar came from a work not solely concerned with the calendar, which is his joint publication with Martin G. Abegg: *A Preliminary Edition of the Unpublished Dead Sea Scrolls*.²⁶ Based on the *Preliminary Concordance*²⁷ compiled by the original editors, Wacholder and Abegg reconstructed about two hundred and twenty unpublished manuscripts of the Hebrew and Aramaic texts from Qumran Cave IV. Among these texts were the

²³ Milik, “Le travail,” 25.

²⁴ For example see Jaubert, *The Date of the Last Supper*, 22-25.

²⁵ Yadin, *The Temple Scroll*, v. 1, 117.

²⁶ B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991).

²⁷ A privately distributed concordance prepared for the original editorial team of the 1950s.

long awaited Mishmarot manuscripts. This edition was not intended for the study of the Qumran calendar, yet it reshaped the course of the whole study for researchers who no longer had to rely on the already released fragmentary information. In the section titled “4Q Mishmerot HaKohanim (Priestly Courses)”, they collected fifteen manuscripts bearing the title “Mishmerot” and part of a document named “S^e”, the “e” manuscript of the *Rule of the Community*. These cover nearly all the identified calendrical texts found at Qumran. Other than supplying the unpublished calendrical texts, they also provided at the end of the book as an appendix the “Luni-Solar Calendar of Qumran -- First Six Year Cycle”.²⁸ It is a six-year table in a modern calendar form incorporating the weekly priestly duty, the festivals, and the occurrences of two lunar phases. Although lots of the elements Wacholder and Abegg put in this table are arguable, it still constitutes a complete form of the Qumran calendar, a simple but clear pictorial representation of a rather complicated and confused subject.

Another contribution made by Wacholder also came from a co-authored work. Working together with Sholom Wacholder, they produced an extensive critique to Jaubert’s theory in 1995.²⁹ Jaubert’s idea that the 364-day calendar of *Jubilees* underlies the biblical text has gained wide acceptance since its release. Although it has been questioned by some scholars on the credibility of certain points of her argument, on the whole it has never been challenged. The Wacholders’ work was an attempt to refute her theory. Their criticism was launched from three directions. They first rejected Jaubert’s claim that the biblical dates favour certain days of the week. They agreed that there are patterns in the biblical dates but argued that these patterns are with the popularity of certain months and days of the months instead of the weekdays. By listing all the dated events in the Hebrew Bible and applying statistical evaluation, they believed that they “have refuted the proofs that the biblical chroniclers built their dates upon a 364-day year corresponding to the Jubilean and Qumran calendars.”³⁰

²⁸ Wacholder and Abegg, *Preliminary Edition*, 104-118.

²⁹ B. Z. Wacholder and S. Wacholder, “Patterns of Biblical Dates and Qumran's Calendar: The Fallacy of Jaubert's Hypotheses,” *Hebrew Union College Annual* 66 (1995) 1-40.

³⁰ Wacholder and Wacholder, “Patterns of Biblical Dates,” 25.

Yet, they did not want to stop at simply disproving Jaubert's argument but rather aimed at providing evidence to show that what underlies the biblical passages, at least in some cases, is the 354-day luni-solar calendar. The second step they took was to search for biblical texts which they thought could illustrate the use of the 354-day lunar year, and they managed to find three: Gen 1:14-17, Gen 7:8, and Lev 23:32. The final phase of their refutation was to highlight a characteristic of the 364-day calendar which, they were convinced, could never be harmonised with the biblical data. The point they raised was the problem of intercalation. The calendar has only 364 days a year which is one and a quarter days short of the natural cycle. If this discrepancy is not adjusted, then the days of the year will gradually drift away from the seasons. While many festivals instituted in Scripture, such as the Passover, the Festival of Weeks, and the Feast of the Booths, are attached approximately to particular times of the seasons, there is no way such a wandering calendar could be the biblical one. The Wacholders believe that the calendar was not intercalated, and their argument was based on the continuity of the different cycles found in the Qumran scrolls. No matter how one views the critique provided by the Wacholders, it does raise serious questions on the credibility of Jaubert's theory of the Qumran calendar as an ancient Jewish calendar.

Beckwith

The question of intercalation has long been a riddle in the study of the 364-day calendar. Ever since the calendar was known from the Ethiopic Pseudepigrapha people have speculated on the problem. Even in acknowledging the absence of evidence to support the existence of the practice, most researchers still favour the idea that the calendar was adjusted by its adherents to match with the solar seasons. Their proposals are usually based on a presupposition that ancient calendars are always in harmony with the natural cycles. It is in the discussion of this difficult aspect of the calendar that Roger Beckwith made his contribution.

As a person interested in chronology and calendar in the Jewish and early Christian literature, Beckwith came naturally into the remit of the study of the

Qumran calendar. He wrote an article “The Modern Attempt to Reconcile the Qumran Calendar with the True Solar Year”³¹ in 1970 specially devoted to the discussion on the issue of intercalation. In this work he reviewed several suggestions made by other scholars and presented his own idea on the subject. Among all the available proposals Beckwith discussed six of them, and he found that some had to be rejected but others remain viable in the light of evidence from various sources. Then he presented three general objections against any method of intercalating the Qumran calendar. The first was an objection on the supposed theoretical need for intercalation. The second rejected the supposed practical need. These first two general objections allowed him to develop his arguments that: firstly, there is no positive evidence demanding the need of the Qumran community to intercalate their calendar, and secondly, there is no definite evidence against the community using a wandering calendar.

The third point raised by Beckwith was not so much an objection but rather evidence to support the view that the people of the calendar accepted and embraced a calendar which denied the natural phenomenon. The evidence perceived by Beckwith was in *I Enoch* 80:2-8, which describes how in the days of the sinners the seasons will not appear at their appointed time and the stars will depart from their ordained path. Beckwith argued that all the phenomena described in this passage could be explained by the one and a quarter days discrepancy between the calendar and the seasons. Here lay the probable theological explanation given by the Qumran community for the departure of their calendar from the natural phenomena. It is not the fault of their calendar but the result of human wickedness which causes even the heavenly bodies to go astray.

Beckwith’s reference to this *I Enoch* passage perhaps should not be seen as definite evidence in support for the lack of intercalation, but it does point to the possibility by providing a plausible explanation for people holding a calendar that does not match with the seasons. Just as the Wacholders’ reference to the cycles in the Qumran scrolls as evidence of rejecting intercalation, Beckwith’s suggestion formed

³¹ R. T. Beckwith, “Modern Attempt to Reconcile the Qumran Calendar with the True Solar Year,” *Revue de Qumrân* 7 (1970) 379-396.

positive evidence in support for the lack of intercalation. The two together provided a strong case to argue against the tide of general accord in demanding for methods of intercalating the calendar.

Glessmer

An active Qumran scholar who holds an entirely different opinion on the question of intercalation is Uwe Glessmer. The starting point of Glessmer's interest in the 364-day calendar was the astronomical chapters of *I Enoch* 72-82. The perplexity of these chapters are well known, but Glessmer attempted to sort out the various astronomical treatises embedded in this chaotic chronological collection and to review them in the context of ancient scientific and astronomical developments.³²

When his interest in the *Astronomical Book* led Glessmer to study the Qumran calendar, he applied the same approach to the calendrical texts, that is to probe into the astronomical systems behind these documents and to search for their sources and origins. Believing that all these documents, both the *Astronomical Book* and the calendrical texts from Qumran, are based on the knowledge of some ancient astronomical understanding, Glessmer favoured harmonisation between the Qumran calendar and the natural cycle. However, in his quest for the intercalation method, a notable difference that made Glessmer stand apart from the others was his endeavour to find hard evidence to support his proposals. In this respect, Glessmer's attention was drawn to a particular Qumran manuscript, 4QOtot (4Q319), of which he is now the official editor.

Before the unpublished material from Cave IV was made known to the public, based on the partial information provided by Milik in his *Book of Enoch*,³³ Glessmer already sensed the possibility that the *Otot*-text might contain crucial information for solving the problem of intercalation. The whole text is almost exclusively a listing of

³² U. Glessmer, "Das astronomische Henochbuch als Studienobjekt," *Biblische Notizen* 36 (1987) 69-129.

³³ Milik, *The Book of Enoch*, 62-65.

an event named “sign” in six jubilee-cycles, from which the text gets its name - *Otot* (signs). Glessmer perceived that this painstaking enumeration of signs for several hundred years is probably a scheme assisting the ancients to adjust their calendar with the true solar cycle. Established on the limited information from Milik, Glessmer made his first proposed scheme on intercalation in 1991.³⁴ Unfortunately for Glessmer this proposal proved to be a misreading when the whole text was released. However, that has not discouraged him from searching for the clue of intercalation in the text. After a careful re-study of the *Otot*-text Glessmer came up with his second proposal.³⁵ Despite the failure of his first proposal as a result of some incorrect information, the two proposals made by Glessmer can be seen as genuine attempts to search for textual evidence for intercalation in the Qumran calendar.

Another piece of research work carried out by Glessmer, in co-operation with Mathias Albani,³⁶ was not exactly on the Qumran calendar, but it formed an important support for Glessmer’s quest for the astronomical correctness of the calendar. The work was a study on an object rediscovered by Glessmer and Albani in the basement of the Rockefeller museum - a limestone disk.³⁷ The object was discovered by Roland de Vaux in 1954 at the site of Khirbet Qumran, and was marked on the inventory list as a “disque de pierre”.³⁸ After their careful study of the features of the disk, Glessmer and Albani concluded that it is no ordinary stone disk but a “unique type of

³⁴ U. Glessmer, “Der 364-Tage-Kalender und die Sabbatstruktur seiner Schaltungen in ihrer Bedeutung für den Kult,” in D. R. Daniels, U. Glessmer, and M. Rösel (ed.), *Ernten, was man sät: Festschrift K. Koch zu seinem 65. Geburtstag* (Neukirchen-Vluyn: Neukirchener Verlag, 1991) 379-398.

³⁵ Glessmer, “The *Otot*-Texts (4Q319) and the Problem of Intercalations in the Context of the 364-Day Calendar”.

³⁶ U. Glessmer and M. Albani, “An Astronomical Measuring Instrument from Qumran,” in D. W. Parry and E. Ulrich (ed.), *The Provo International Conference on the Dead Sea Scrolls: Technological Innovations, New Texts, and Reformulated Issues* (Studies on the Texts of the Desert of Judah 30; Leiden: Brill, 1999) 407-442.

³⁷ Glessmer and Albani, “An Astronomical Measuring Instrument,” 407.

³⁸ For inventory reference of the object see Glessmer and Albani, “An Astronomical Measuring Instrument,” 407, n. 3.

astronomical instrument or ‘sundial’” with three probable functions: finding orientation, fixing the cardinal points of the year, and locating the seasonal hours.³⁹ With these proposed functions they were able to suggest: “It could have been used to handle the discrepancy between 365.25 days and a calendar year of 364 days. It allows the determination of the cardinal points and fixing a calendar whose seasons ... are as near as possible to the signs of sun, moon and stars.”⁴⁰ If their interpretation of the object is right it may form hard evidence for supporting the view that people at Qumran did observe the seasons as closely as the other Jews surrounding them.⁴¹

SCOPE OF THE THESIS

Looking over the development of Qumran calendar scholarship, it is not difficult to notice that there is a watershed in its progress. The release of the unpublished material in 1991 was a turning point not only for the study of the calendar but the research of the Qumran scrolls as a whole. This is not to say that the information provided by the original editors about the unpublished calendrical texts is inaccurate. In fact, what Milik released in his preliminary publications is a very precise and rather complete description of what is found in these documents. The vital difference between the pre-1991 and post-1991 study is that researchers can now access this primary material directly to evaluate the earlier claims and to further advance the study.

Surprisingly, not much research has been done on the Calendrical Documents since their release. In general, they are now included in most of the books providing complete translations or transcriptions of the scrolls.⁴² However, as far as study is

³⁹ Glessmer and Albani, “An Astronomical Measuring Instrument,” 436-437.

⁴⁰ Glessmer and Albani, “An Astronomical Measuring Instrument,” 442.

⁴¹ The identification of the object as a sundial has recently been challenged by A. Levy, who suggested that the disk is more likely to be a board for an ancient game called *mehen*, “Bad Timing: Time to Get a New Theory,” *Biblical Archaeology Review* 24, no. 4 (1998) 18-23.

⁴² For examples García Martínez and Tigchelaar, *Study Edition*; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992); M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scroll: A New Translation* (London: HarperCollins, 1996).

concerned, only a few individual documents have been dealt with in some articles. Yet the sparse interest on these documents should not undermine the importance of their contribution to the understanding of the Qumran calendar. If the term “calendar” is taken in the wider sense of being not only a system of arranging days and months but also a method of dating important events and festivals in a year, then the Qumran calendrical material can be roughly classified into three categories:⁴³ (1) texts which deal with the importance of calendrical reckoning or hint at the calendrical dispute but bear no actual data about the calendar itself;⁴⁴ (2) texts which contain information and data directly related to the calendar but which do not take it as their sole subject;⁴⁵ and (3) texts which deal with the calendar only.⁴⁶ It is the third category that the term “Calendrical Documents” refers to in this thesis, and they can be seen as the “calendar proper” although not in its modern sense or form. Their single-minded focus in dealing with the arrangements of the calendar should justify these documents in taking a central role in any study of the Qumran calendar. Nevertheless, the attention of scholarship hitherto has been focused on the first two categories. We cannot say that the material of these categories are insignificant for they have drawn attention to the importance of the calendar. However, now that the Calendrical Documents are accessible, these should be more carefully studied for the light that they can shed on the understanding of the Qumran calendar.

Throughout my research work on this topic questions concerning these documents were frequently raised: Can what we say about the Qumran calendar be

⁴³ The method of classification is adopted from P. R. Callaway, “The 364-Day Calendar Traditions at Qumran,” in Z. J. Kapera (ed.), *Mogilany 1989, Papers on the Dead Sea Scrolls Offered in Memory of Jean Carmignac* (vol. 1, Krakow: Enigma, 1989) 19-29, 21.

⁴⁴ In this category one could put *Damascus Document*, *Peshar Habakkuk*, *Rule of the Community*, and *Hodayot*.

⁴⁵ This category contains the majority of the calendrical related texts: *Jubilees*, *Astronomical Book of Enoch*, *Temple Scroll*, *Psalm Scroll*, *Songs of Sabbath Sacrifice*, *War Scroll*, 4Q252-Chronology of the Flood Story, 4Q503-Daily Prayer, 4Q318-Brontologion.

⁴⁶ Texts under this category are those grouped together under the title “Mishmarot” or “Calendrical Document” plus a couple of others that are put under some special titles, such as 4Q317-Phases of the Moon, and 4Q319-Otot.

confirmed with these texts? Do these texts represent a single calendrical system or contain various calendrical traditions? What do these texts say on the issues about intercalation, lunar reckoning, and others? It is these questions which have compelled the thesis to confine itself to focus on the Calendrical Documents only. It is true that these documents will not have answers for all the questions debated about the Qumran calendar, and on some particular issues they may even have nothing to say. However, even so it is still important to know that this fundamental material has not been overlooked. It is under this consideration that the Calendrical Documents are set as the central core of material for the study of this thesis.

Only defining the core material is not sufficient to setting up the scope for the thesis. It is still necessary to define the objective of the study. As the brief review on the scholarship revealed, the study of the calendar is a complex subject involving many related issues. Hence it is impossible for any study to cover every aspect of the subject, and therefore it is necessary to limit the study within an achievable target. The objective of this thesis is set on a very fundamental aspect of the subject, that is the time reckoning system in the selected material. The scope may sound basic but it is by no means insignificant to the calendrical study as a whole. No matter whether it is regarding the origin of the calendar or its role and function in Jewish history, it is necessary to compare the time reckoning method of this calendar with other known calendrical systems. When one says this calendar originated from a certain ancient calendrical system or it was different from the calendar used by other Jews, one needs to have answers for a fundamental question: How similar or different is this calendar when it is compared with the others? The objective of this thesis is to establish a solid base for answering questions as such, that is to tell how time is regulated in the Qumran Calendrical Documents.

List of Qumran Calendrical Documents

Since the “Calendrical Documents” will form the core study material of this thesis, it is necessary to define which texts are referred to under this title, and to say a few words on how the list was made up. The collection of Calendrical Documents

contains a total of eighteen manuscripts, all from Qumran Cave IV, which include the sixteen 4QMishmarot manuscripts together with 4QOtot (4Q319) and 4QCryptA Phases of Moon (4Q317). All these texts deal with the calendar only. The Mishmarot manuscripts need no explanation, for from the early days they have already been put together under the same title because of their resemblance to certain calendrical formats. In the case of 4QOtot its inclusion in the list should also be quite clear. The manuscript has many features resembling the Mishmarot texts, and throughout its surviving fragments the sole concern is the enumeration of calendrical events only. Moreover, other than the *Otot*-section, which occupies the major portion of the manuscript and hence is so named, there are other sections which are in strict resemblance to some Mishmarot texts. For the 4QPhases of Moon its presence in the list is rather more of a problem which needs to be explained. The manuscript does not have strict parallel features to the Mishmarot, and it is arguable whether the subject it deals with is astronomical or calendrical. However, there is no doubt that this manuscript's only focus is on enumerating a single event - the phase change of the moon, and this event is closely related with some other events recounted in the Mishmarot texts. In a sense, it may represent a more refined form of the calendar which justifies its inclusion in the list.

The exclusion of some texts also needs some explanation. There are two other manuscripts also bearing the title "Calendrical Document", 4Q337 and 6Q17, but they are both very fragmentary with only a few identifiable words. They are the right sort of text but are excluded on the basis of the amount of information they can provide. 4QBrontologion (4Q318) resembles the form of Calendrical Documents in recounting events and dates. However, it differs from them on a crucial point - the purpose for recounting the dates. In this text it is not for dating events or festivals but for reading omens and forecasting the future. It is this difference which separates it from the Calendrical Documents, and hence leads to its omission from the list. A group of manuscripts identified as 4QAstronomical Enoch is closely linked to the Calendrical Documents in many aspects. The reason for keeping it out of the list is not because it is not calendrical but rather because it is more than calendrical. It deals not only with the calendar but at the same time also incorporates many other subjects, such as

astronomy, geography, and cosmology. The exclusion of the Qumran copies of the *Astronomical Book of Enoch* as the Calendrical Documents by no means implies that it is insignificant for the study of the Qumran calendar. On the contrary, it is exactly because of its significance that it deserves more specific and in-depth exploration, which is not only beyond the limitation of this thesis but also does not match its objectives.

APPROACH OF THE THESIS

Approach of the Thesis - Setting a Reliable Reading

After deciding the core material for study, the next thing to be considered was how this material was to be approached. With the Calendrical Documents taking up the central role in the study, the controlling question for the whole thesis was now: What do these documents say about the time reckoning system of the Qumran calendar? To tackle this question, the approach of the thesis will proceed in two stages: first, to build up a reliable reading, and second, to extract information about the calendar from this reading.

In order for any useful data to be drawn from the Calendrical Documents, it is essential to have a reliable reading. At present, the most comprehensive and relatively most reliable reading available for most of the Calendrical Documents is still the one prepared by the original editors as recompiled and printed in the *Preliminary Edition*,⁴⁷ but the original transcription was done some forty years ago and needs to be revised and updated to incorporate more recent scholarship. Some other complete sets of transcription on these documents are also available, such as those in the *Study Edition*,⁴⁸ but they are more or less the reprint of the original editors' work. Individual studies on some of the manuscripts, such as the preliminary publications produced by

⁴⁷ Wacholder and Abegg, *Preliminary Edition*.

⁴⁸ García Martínez and Tigchelaar, *Study Edition*.

Talmon, provide better readings, but they do not cover all the manuscripts. Therefore, a thorough textual study on these documents is still indispensable for a thesis treating them as its core material of study.

The aim of Chapter 2 is to produce a transcription as close to the original as possible together with an accurate translation for every manuscript of the Calendrical Documents. Rather than only relying on published material, the work of this chapter will try to refer to the original material, that is the surviving fragments of the manuscripts, as much as possible. However, there is a limitation to this attempt which is the accessibility of the actual fragments. So, it has to be based on an indirect source of the material - the photographs of the original scrolls. The release of the *Dead Sea Scrolls Electronic Reference Library*⁴⁹ makes this “next-to-the-best source to the scrolls” much more accessible to researchers, and so much aids their research. Yet, deciding to work with the photographs would also mean accepting the limitation of relying on the original editors for the identification and grouping of the fragments and their physical placement in the photographs. Although the task of identifying the innumerable fragments seems almost an impossible mission to many, the job done by the original editors has proved time and again to be accurate and reliable. So it is not much of a hindrance to this study to begin with the work of these editors. For each manuscript, the same procedure will be followed:

1. select an existing transcription, which in most cases will be from the *Preliminary Edition*, and check its reading with the photographs,
2. compare this reading with other available transcriptions,
3. remark on significant reading variances in the textual notes,
4. translate the reading into English,
5. comment on the major difficulties in reading the text.

Hopefully with this chapter a relatively more reliable reading of all the Calendrical Documents will be established for the subsequent stage to build on.

⁴⁹ T. H. Lim and P. S. Alexander, (eds.), *The Dead Sea Scrolls: Electronic Reference Library* (Oxford: Oxford University Press; Leiden: Brill, 1997).

Approach of the Thesis - Analysing the Calendrical Documents

After ensuring all the Calendrical Documents are carefully studied, the next stage of the research is to collect information about the Qumran calendar's time reckoning system from these documents.

Chapter 3 will be dedicated to the study of the structure of the calendar. As mentioned above, even before the discovery of the Qumran scrolls scholars had already worked hard in probing the structure of the 364-day calendar based on the limited information from the Pseudepigrapha, and had achieved remarkable results. The finding of texts alluding to a calendar bearing the same special characteristic, that is having only 364 days in a year, led to the already known structure being superimposed onto the newly found texts. This might turn out to be a correct understanding, but without careful examination of this presupposition the danger of misrepresentation is always there. In order to remove this danger all the manuscripts will be examined for their calendrical structure. Only the extant texts found on the fragments, rather than the restoration proposed by the editors, will be checked for their agreement with the hypothetical structure of the 364-day calendar. Although the term "Qumran calendar" is mentioned repeatedly in this introductory chapter, it is used for convenience only. There is no assumption that there existed only one single calendrical system in all these documents. In fact, how many calendars are evident in the Calendrical Documents will be one of the key aspects to be investigated. Therefore alternative conjectural structures will also be proposed and compared with the extant texts to test the validity of the assumed structure. There are two purposes for these tests: first, to confirm that these documents are indeed based on a calendar having only 364 days in a year, and second, to see whether they conform to a particular way of arranging the days and the months in the 364-day year.

Other than the 364-day year and its associated arrangement of the days and the months, the lunar cycle also plays an important part among the enumeration of the Calendrical Documents. Chapter 4 will be devoted to the analysis of the reckoning system of the lunar cycle in these documents. Things that this chapter wants to find out about the lunar cycle are: Is there only one lunar reckoning system in the

Calendrical Documents? How much can we know about this lunar system from the extant texts? Do these documents despise the lunar cycle or honour it?

No matter how meticulously the days and months are arranged in the years, any intercalary adjustment will inevitably have an impact on the overall concept of a time reckoning system. Chapter 5 will be dedicated to study the existence of longer term adjustment to the calendrical structure established in the previous chapters. No text related to the 364-day calendar has ever been definitely identified as dealing with the problem of intercalating the calendar, but indirect information can still be gleaned about this issue. The questions to be asked in this chapter are: Is there positive evidence in the Calendrical Documents alluding to the method of intercalation? Or is there intrinsic evidence that stands against the idea of intercalating the calendar?

A genuine aspiration of this thesis is that having gone through the proposed studies and analyses a clearer perception on this fundamental and vital aspect of the Qumran calendar, its time reckoning system, can be established.

CHAPTER 2

TEXTUAL STUDY OF THE QUMRAN CALENDRICAL DOCUMENTS

Despite its popularity and significance in Qumran studies, research into the Qumran calendar is hampered by the lack of comprehensive and reliable editions of the documents. Since the *editio princeps* of the Calendrical Documents is still under preparation, any one who works on this subject will be handicapped by the lack of a reliable text-base. It is within this context that this thesis, a study with its main focus on the analysis of the Calendrical Documents, needs to conduct a thorough examination of these documents before moving on to the subsequent discussions.

Rather than working from scratch this textual study of the Calendrical Documents will be building on the work of other scholars. The main base material chosen for this purpose is the texts entered in the *Preliminary Edition (PE)*.¹ As a compilation of the work of the original editors, the *PE* has the advantage of firstly being comprehensive in the scope of texts covered, and secondly being the closest available publication to what has been achieved by the original editors. The drawback of using the *PE* is that it does not include the most up-to-date research, and also that it does not cover all the documents required. In these respects this chosen base has to be supplemented by other materials. In recent years editors have released preliminary reports for three (4Q321, 4Q321a, and 4Q325) out of the eighteen manuscripts. These more updated reports will replace the *PE* as the base of comparison. Two manuscripts (4Q317 and 4Q324c) in this study are not included in the *PE*. For 4Q317, the chosen base text is the transcription found in the *Study Edition (SE)*.² This edition gives a good coverage of the text concerned but lacks indicators for the certainty of the reading of the letters. For 4Q324c, a very fragmentary manuscript written in cryptic script, the base text is the one included in the Dead Sea Scrolls CD-

¹ Wacholder and Abegg, *Preliminary Edition*.

² García Martínez and Tigchelaar, *Study Edition*.

ROM produced by the Foundation for Ancient Research and Mormon Studies of the Brigham Young University.³

For each manuscript the chosen base text will be checked fragment by fragment with the photographs in *The Dead Sea Scrolls Electronic Reference Library*⁴. Photographs of the Calendrical Documents have been extracted from the *Electronic Library* CD-ROM and are attached as Appendix A. However, the photographic plates in the attached appendix are not the exact replica of plates under the Palestine Archaeological Museum (PAM) reference numbers. The PAM photographs have been rearranged and enhanced, and fragment- and column-numbers have been added to facilitate referencing. After checking with the photographs, a transcription and translation will be produced for each fragment with all the modifications made to the chosen base material noted either under the Notes of Reading section or in the Comments section which will be subsequent to the transcription and the translation respectively. As well as the base materials, other related works on the manuscripts will also be consulted to produce an accurate reading. All the consulted materials will be indicated at the beginning of the section on each manuscript.

Line reference numbers in the proposed transcriptions of this thesis may differ from those in the base texts or other important reference material. Whenever this happens a Line Correspondence Chart will be provided for easy cross reference. Throughout the thesis line references of the Calendrical Documents are made on the basis of the numbers stated in the proposed transcriptions.

³ Foundation for Ancient Research and Mormon Studies, Brigham Young University, Provo, Utah, *Dead Sea Scrolls Electronic Reference Library*, 2 (CD-ROM; Leiden: Brill, 1999).

⁴ Lim and Alexander, *Electronic Reference*.

4Q317. 4QcryptA Phases of the Moon (*olim* 4QAstrCrypt)

(PLATES I-II)

Bibliography: J. T. Milik, (ed.), *The Book of Enoch, Aramaic Fragments of Qumrān Cave 4* (Oxford: Clarendon, 1976) 68-69; M. O. Wise, "Second Thoughts on 4Q317 and the Qumran Synchronistic Calendars," in J. C. Reeves and J. Kampen (ed.), *Pursuing the Text: Studies in Honor of Ben Zion Wacholder on the Occasion of his Seventieth Birthday* (JSOT Supplement Series 184; Sheffield: Sheffield Academic Press, 1994) 111-118; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 301-303; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 672-677.

Fragments

Altogether there are approximately seventy fragments identified with this manuscript. Most of them are very small and contain words, where there are any, that have no significant value for the understanding of the content of the text. Only four of the larger fragments, which can be found with the first two of the final six photographs, are included in the study. Fragment 1, as shown in PAM 43.375, consists of two portions separated by a gap which contains no more than one missing line. The relative position of the two portions can be shown by the continuity of the line of breakage that forms the right hand margin of the upper portion and carries on to the middle of the lower portion. Two columns are found in this fragment. The first column has the bottom fourteen lines preserved, but with only the last one or two words in each line intact. In the second column, the first few words of thirty-three lines, which probably constitutes the entire column, are found. There are altogether approximately two hundred and eighty characters found in this fragment. Fragments 2-4 all contain the bottom part of columns, as shown by the lower margins preserved with them. Fragment 2 has thirteen lines and one hundred and sixty-one characters, and fragment 3 has nine lines and seventy-two characters. Fragment 4 is a similar size to fragment 3 but is badly damaged with only approximately forty-two discernible characters distributed throughout nine lines.

Palaeography

This manuscript is written in a script known as Cryptic Script A. Seven manuscripts among the scrolls found at Qumran are written in this cryptic script and they are all from Cave IV. Letters of this script are also used as margin notes and signs in several other manuscripts.⁵

Hebrew	א	ב	ג	ד	ה	ו	ז	ח	ט	י	כ
Cryptic Script A	𐤀	𐤁	𐤂	𐤃	𐤄	𐤅	𐤆	𐤇	𐤈	𐤉	𐤊
Hebrew	ל	מ	נ	ס	ע	פ	צ	ק	ר	ש	ת
Cryptic Script A	𐤋	𐤌	𐤍	𐤎	𐤏	𐤐	𐤑	𐤒	𐤓	𐤔	𐤕

Since no chronology has been set up for this esoteric script, it is difficult to estimate the date of this manuscript by palaeography. According to Pfann this manuscript is contemporary to 4Q249 (*Midrash Sefer Moshe*), and together they are from a roughly contemporary but earlier period than another Cryptic A manuscript 4Q298 (Words of the Maskil to All Sons of Dawn) with noticeable tendencies of development of the script separating between the two periods.⁶ Since palaeographic study of the square “Jewish” script in 4Q298 dates the manuscript to the period of late first century BCE, 4Q317 is likely to have belonged to the period of late second century to early first century BCE.

⁵ References for manuscripts in Cryptic A can be found in S. J. Pfann and M. Kister, “298. 4QcryptA Words of the Maskil to All Sons of Dawn,” in T. Elgvin and others (ed.), *Qumran Cave 4.XV: Sapiential Texts, Part 1* (DJD 20; Oxford: Clarendon, 1997) 1-30, 7, n. 18. Manuscripts in cryptic writings were assigned to Pfann for the preparation of the official publication. The first one published was 4Q298, 4QcryptA Words of the Maskil to All Sons of Dawn, in *DJD 20*, which also included a detailed study on the letters of Cryptic A in 9-13.

⁶ Pfann and Kister, “298. 4QcryptA Words of the Maskil”, 9.

Line Correspondence Chart

Proposed			Study Edition		
Frg.	Col.	Lines	Frg.	Col.	Lines
1	i	18-33	2	i	1-16
1	ii	1-22	1	ii	1-22
1	ii	24-33	2	ii	7-16
2		1-13	3		1-13
3		1-9	4		1-9
4		6-14		n/a	

Mus. Inv. 896, 897, 899, 900, 902, 903

PAM 40.625, 41.288, 41.346, 41.348, 41.349, 41.374, 41.375, 41.457, 41.461, 41.463, 41.464, 41.479, 41.480, 41.660, 41.661, 41.637, 41.643, 41.644, 41.824, 41.859, 41.863, 42.424, 42.425, 42.426, 42.427, 42.428, 43.375, 43.376, 43.377, 43.378, 43.379, 43.380.

Frg. 1 i

][	18
תב]וֹא לִיּוֹמִי	19
תבוא לִיּוֹמִי	20
תבוא לִיּוֹמִי	21
תבוא לִיּוֹמִי	22
תבוא לִיּוֹמִי	23
תבוא לִיּוֹמִי	24
תבוא לִיּוֹמִי	25
תב]וֹא לִיּוֹמִי	26
תב]וֹא לִיּוֹמִי	27
תב]וֹא לִיּוֹמִי	28
תב]וֹא לִיּוֹמִי	29
תב]וֹא לִיּוֹמִי	30
תב]וֹא לִיּוֹמִי	31

ע • • • א	32
בוא	33

bottom margin

TRANSLATION

18.]•[
19. ente]rs the day
20. enters]the day
21. enters the d]ay
22. enters the d]ay
23. enters the da]y
24. enters the d]ay
25. enters the d]ay
26. enters] the day
27. ent]ers the day
28. enters] the day
29. ent]ers the day
30. ente]rs the day
31. enters] the day
32.]^c...[>]
33.]enters

Frg. 1 ii

].א•[	1
[בח]{מש}ה בֹּו] תכסה שתימ]	2
[ע]שֹׂרא וּכְנָ תבוא ליום בששה בו]	3
תכסה שלוֹשׁ] עשרא וּכנ תבוא ליום]	4
בש<ב>{ע}ה בו תכס]ה ארבע עשרא וּכנ]	5
[תבוא ליום vacat]	6
בש{מנ}ה בו ת]משול אורה ליום בתוכ]	7

הרקיע ממנ'על <ארבע עשרא וחצי> ובבוא השמש יכלה]	8
אורה להכס'ות] וכן יחל להגלות]	9
באחד לשבת vacat [בתשעה בו תגלה]	10
מחלוקת אחת] וכן תבוא ללילה]	11
ב{ע}ש{ר}ה בו ת'גלה שתימ וכן תבוא]	12
ללילה vacat ב'עש'תי עשר בו תגלה שלוש]	13
וכן תבוא לל'יל]ה' vacat [	14
ב{שנימ} עשר ב'ון' תגלה ארבע וכן]	15
תבוא ללילה vacat בש'לושה עשר בו]	16
תגלה חמש וכן ת'בוא ללילה]	17
ב<////>שלושה עשר בו תג'לה שש וכן תבוא ללילה]	18
[בח]{מש}ה עשר ב'ון' תגלה שבע וכן תבוא]	19
ללילה vacat ב{ש}{שה עשר בו תגלה]	20
שמונה וכן תבוא ללילה vacat [	21
[בש]>[ב] עשר] בו תגלה תשע וכן תבוא ללילה]	22
[בשמונה עשר בו תגלה עשר וכן תבוא ללילה]	23
ב{תש}{ע}ה ע'שר בו תגלה עשתי עשרא וכן תבוא ללילה]	24
ב>-'<תשעה עשר] בו תגלה שתימ עשרא וכן תבוא ללילה]	25
ב</>ע'שרימ בון' תגלה שלוש עשרא וכן תבוא ללילה]	26
ב<////>אחד ועשרי'מ בו תוציא אורה ליום בתוכ הרקיע]	27
ממעל <ארבע ע'שרא וחצי > ובבוא] השמש יכלה אורה להגלות]	28
כ'כן יחל לה[כסות באחד לשבת]	29
ב'ש'לוש}>ה' וע'שרימ בו תכסה מחלוקת אחת וכן]	30
ת'ב]וא ליום vacat [	31
ב<////>שלושה ועשרי'מ בו תכסה שתימ וכן תבוא ליום]	32
ב{חמש}ה ועשרי'מ בו תכסה שלוש וכן תבוא ליום]	33

bottom margin

NOTES ON READINGS

L. 2 [בח]{מש}ה. Letters in front of the ה have been emended. The two identified letters מש are superimposed on top of some partially erased letters, which are most likely to be רבע. This suggests that the word is a correction of בארבעה to בחמשה.

L. 5 בש>ב{ע}ה. The ע is adjusted from a ש, and a ב is written superlinearly in front of it. The word, hence, is adjusted from בששה to בשבעה.

L. 7 בש{מנ}ה. The letters מנ are emended from בע, which changes the word from בשמנה to בשבעה.

L. 7 ת[משול] כול היום. Wise restores these words as ת[משול] כול היום.⁷ The restoration of these words has to rely upon other fragments, and Wise's suggestion is not supported by the remnant letters found in 2:7 and 3:8. The letter in front of יום is clearly not a ה but more likely to be a ל. The first letter of the word following תמשול is more likely to be a א rather than a כ. For the discussion on the reading of these two letters see the notes on 2:7 and 3:8.

L. 11 מחלוקת. The word should read מחלוקת as supported by the readings in 2:10 and 4:14.

L. 12 ב{ע}{ש}{ר}ה. Adopting Milik's reading, most studies do not spot the correction of this word. The emendation of this word although not as obvious as some others in this fragment is still discernible. According to the pattern of other corrections found in this column, if there is any change carried out on this word it is most likely to be a change from בתשעה to בעשרה. The change of the fourth letter from ע to ר (from 𐤓 to 𐤒 in Cryptic A) in this case is difficult to detect because the letter is partially damaged. However, traces of adjustment can be found with the second letter ע (changed from 𐤒 to 𐤓 in Cryptic A). The first hint is the form of the letter. Compared to other occurrences of the same letter in the column, for example

⁷ M. O. Wise, "Second Thoughts on דוק and the Qumran Synchronistic Calendars," in J. C. Reeves and J. Kampen (ed.), *Pursuing the Text: Studies in Honor of Ben Zion Wacholder on the Occasion of his Seventieth Birthday* (JSOT Supplement Series 184; Sheffield: Sheffield Academic Press, 1994) 98-120, 113.

the one in line 8, the down stroke of this letter does not bend as sharply as the others creating a more open angle between the two strokes. This may indicate that when the scribe superimposed the correct letter onto the original letter he deliberately wrote the down stroke further towards the bottom to cover up the vertical stroke of the original letter. Secondly, where the two strokes meet the writing is blurred thus forming lines thicker than usual. Again this may indicate a correction in the form of writing a new letter onto an old one. From the evidence the original letter ט was most likely partially erased and a new letter ע was written onto it to cover up the remaining traces.

L. 15 {שנימ} ב. The word is a correction from בעשתי by writing שנימ over עשתי.

L. 17 חמש. The *SE* has mistakenly transcribed the word as חמשה even though the ה is clearly not there.

L. 18 בו. Another transcription mistake in the *SE* made by omitting the word.

L. 18 ב<4>שלושה. A superlinear cipher “4” is put right on top of the number to correct it from thirteen to fourteen. The transcription עשר (ארבעה) בשלושה in the *SE* does not represent what is in the fragment. There is no need for modern editors to correct the text because the adjustment had already been made by the ancient scribe.

L. 19 {מש}ה [בח]. As in the line above, the *SE* fails to discern the correction but puts in a modern amendment עשר (בחמש) [בארב]. The correction was already done by the ancient scribe. The last three letters of the first word can clearly be read as משה instead of עה. Although no trace of the old letters can be discerned, the very uneven spacing between the three preserved letters may indicate a correction of putting three new letters חמש into the space of four erased letters ארבע.

L. 20 {ש}ש [שה] ב. It is not clear whether the word has been emended. The letter following the ב is partially damaged with only the top horizontal stroke and the right down stroke remaining. These remaining strokes can be identified as either a ש (𐤑) or a ח (𐤇). With the similarity of the right hand side of the two letters, even if there is a change in the letter it is difficult to judge from what is left in the fragment. However, in light of other adjustments in the column the word is more likely to be a correction from בחמשה to בששה.

L. 22 [בש]>[ב]ע[ה]. The superlinear ב, the only remaining letter in the word, indicates a correction from בששה to בשבעה. A similar correction is found in line 5 with the same characteristic superlinear ב.

L. 24 ב. {תש}[ע]ה. Two clues hint at the possibility that the word is a correction from בשמנה. First, the ה is likely to be an emendation from a ש. Second, the overall length of the word is longer than the same word right in the line below.

L. 25 ב. <[ח]שעה. The number is adjusted from 19 to 20 by writing a superlinear cipher “10” (ח) on top of the word בשעה.

L. 26 ב. <[ע]שרים. Similarly as in the line above, a superlinear cipher “1” is written to change the number from 20 to 21.

L. 27 ב. <[א]חד. A superlinear cipher “2” is written to change the number from 21 to 22.

L. 29 כִּכְנִי. This is transcribed as כִּכְנִי in the SE. The first letter is partially damaged with only its left hand side remaining. In this remaining part a small semicircle is written on the upper half with nothing underneath. This remnant could be part of any of the following letters ב(כ), ח(כ), י(כ), כ(כ), or ר(כ) but definitely not of a י(כ).

L. 30 בִּשְׁלֹשָׁה <[ה]. The word is corrected from בשני by superimposing the letters לֹשׁ onto נים and adding the letter ה superlinearly.

L. 32 ב. <[שלושה]. The number is changed from 23 to 24 by adding a superlinear cipher “4” on top of the incorrect word.

L. 33 ב. {חמש}ה. The word is a correction from בארבעה by superimposing the letters חמש onto ארבע. The original letters are partially erased, but their traces can still be seen underneath the imposed letters.

TRANSLATION

1.]··[
2. [On the fi]fth of it,[it covers
3. twel]ve, and so[it enters the day. On the sixth of it]

4. it covers thir[teen, and so it enters the day.]
5. On the seventh of it, it cov[ers fourteen, and so]
6. it enters the day. *vacat* []
7. On the eighth of it, [it rules its light for a day in the midst of]
8. the sky abov[e. <fourteen and a half> And when the sun comes]
9. its light [ceases] to be covered, [and thus it begins to be revealed]
10. on the first of the week. *vacat* [On the ninth of it, it reveals]
11. one part, [and so it enters the night.]
12. On the tenth of it, it [reveals two, and so it enters]
13. the night. *vacat* On the ele[venth of it, it reveals three,]
14. and so it enters the night.[*vacat*]
15. On the twelfth [of it, it reveals four, and so]
16. it enters the night. *vacat* On the thi[rteenth of it]
17. it reveals five, and so [it enters the night.]
18. On the <////> thirteenth of it, it re[veals six, and so it enters the night.]
19. [On the fi]fteenth of it,[it reveals seven, and so it enters]
20. the night. *vacat* On the si[xteenth of it, it reveals]
21. eight, and so [it enters the night. *vacat*]
22. [On the se]v[en]teen[th of it, it reveals nine, and so it enters the night.]
23. [On the eighteenth of it, it reveals ten, and so it enters the night.]
24. On the nin[eteenth of it, it reveals eleven, and so it enters the night.]
25. On the <-> nineteenth[of it, it reveals twelve, and so it enters the night.]
26. On the </> twentieth of it,[it reveals thirteen, and so it enters the night.]
27. On the <///> twenty-first[of it, it releases its light for a day in the midst of the sky]
28. above. <four[teen and a half...]> And when [the sun] comes [its light ceases to be revealed,]
29. as thus it begins to be c[overed on the first of the week.]
30. On the [twent]y-third [of it, it covers one part, and so]
31. it enters the day. *vacat* []
32. On the <////> twenty-third[of it, it covers two, and so it enters the day.]

33. On the twenty-fifth [of it, it covers three, and so it enters the day.]

COMMENTS

L. 7-10. The restoration of lines 7-10 is based on the parallel sections in the other fragments: 1 ii 27-29; 2:7-9; 3:8-9; and 4:11-13.

L. 8 **השמש יכלה**. Adopting the restoration suggested by Milik⁸ the editors of the *SE* reconstruct יהיה after השמש. This restoration does not match what is found in 2:8, where the word following השמש has the first two letters preserved as יכ. To restore this word as יכלה as suggested by Wise⁹ matches better with the evidence found in 2:8, and it also makes better sense with the interpretation of the text.

L. 27-29. The section in lines 27-29 is the only incidence among the four fragments that a full moon is referred to. The preserved wording found in these lines show that the author employed a similar description for the full moon as for the section of the dark moon. This supports the restoration of these lines according to the sections on the dark moon. The word תוציא restored here is only a conjectural suggestion. However, the principle of the restoration for lines 27-29 is to keep the structure of the section as close to the description on the dark moon as possible. To keep the structure but to reverse the meaning of the description, an antonym of תמשול is needed here. Another possible suggestion for the word is תאזב.

Frg. 2

]	לֹוּ	1
]	שְׁנִימָ	2
]	לְיוֹמ vacat בֹּ	3
בֹּ	תְכֶסָּה שְׁ[תִימָ] עֶשֶׂר] אֶ וְכֹנְ [תְּבוֹא לְיוֹמ	4
]	תְּכֶסָּה שְׁלוֹשׁ עֶשֶׂר] אֶ וְכֹנְ [תְּבוֹא לְיוֹמ	5
]	בֹּ תְכֶסָּה אַרְבַּע עֶשֶׂר] אֶ וְכֹנְ [תְּבוֹא לְיוֹמ	6

⁸ Milik, *The Book of Enoch*, 68.

⁹ Wise, "Second Thoughts", 113.

7	[... • • •] [תמשול] • [ליום •]
8	>[א]רבע עשרא וחצ'י [תוא ו] < [ובבוא השמש יכל'ה] [ל אורה]
9	[י]חל להגלות בארבע לשבת]
10	ב' תגלה מחלוקת אחת וכן תב'א ללילה
11	[בו תגלה שתימ וכ'נ] תבוא ללילה
12	[ה' בו תגלה שלוש וכן תבוא ללילה]
13	ב' תגלה ארבע וכן תבוא ללילה

bottom margin

NOTES ON READINGS

L. 2]שנימ'. The first three letters can be identified with confidence. In the *SE* this line and the previous one are entered as: [...]... 2-1.

L. 7 • [ליום] תמשול. Wise reads here היום [כול].¹⁰ The letter in front of יום is not, however, a ה but a ל. The slightly inclined and wavering stroke cannot possibly be mistaken for the top horizontal stroke of the ה.

L. 8]ל אורה] >[א]רבע עשרא וחצ'י [תוא ו] < [ובבוא השמש יכל'ה] [ל אורה]. This line in the *SE* is: [הרקיע א]רבע עשרא וחצ'י [ובבוא השמש יד'יה] [...] [ב'חור ו] [...] אורה] להכסות], which is probably a misprint for in the corresponding translation only “fo]urteen and a hal[f]” and “[... in] the midst and [...]” are marked as superlinear insertions. However, even taking the misprint into account the *SE* transcription is still not an accurate representation of what is in the fragment. Firstly, the superlinear words should not be taken as two separated insertions. Although the space between the two visible portions of this inserted line seems to be blank, the empty space corresponds exactly to similar spots in other lines of this fragment where the surface of the parchment has worn away leaving a blank area or illegible letters. Judging from the remaining letters, the seemingly blank area is certain to have contained some missing letters, for example the י of וחצ'י and a letter or letters in front of תוא] to complete the word. Considering that the space between these two portions can contain no more than a

¹⁰ Wise, “Second Thoughts”, 113, n. 35.

few letters, they can only be regarded as parts of a single inserted line instead of two different insertions. Secondly, the first two letters of the word following **השמש** can clearly be read as **יכ** instead of **יה**. The open loop at the top right corner of the second letter cannot be mistaken as a **ה**. So the remnant letters do not support the reading of **יהיה** here, and hence they also reject the reconstruction of the same word in the other parallel sections. Thirdly, the legible letters in the second part of the inserted line are **ו]תוא** instead of **ו]בתוכ**. The **א(ח)** can be identified by the faint but discernible characteristic slash towards the lower left corner. The *SE*'s restoration of a known word from the text, although looks attractive, is not acceptable.

L. 9 **בארבע לשבת**. The *SE*'s **באחד [השבת** is a misreading of the text. The letter in front of **שבת** has a discernible **ל**, a reading supported by the parallel section in 1 ii 10. The preceding word is not **באחד** but **בארבע**. Other than the **ע** the other letters can all be identified without difficulty.

TRANSLATION

1.] ..lw[
2.]two[
3. for]the day *vacat b*[
4. of]it, it covers t[welv]e, and so [it enters the day.
5.]it covers thirt[ee]n, and so it e[nters the day.
6.]of it, it covers fou[rtee]n, and so it [enters the day.
7.]w...[]it rules[]· for a day ·[
8. <[fo]urteen and a hal[f]tw'w[>]And when the sun comes it cea[ses]/
its light[
9. it be]gins to be revealed on the fourth of the week.[
10. of]it, it reveals one part, and so it ente[rs the night.
11.]of it, it reveals two, and s[o] it enters the ni[ght.
12.]h of it, it reveals three, and so it enters the nig[ht.
13. of]it, it reveals four, and so it enters the nig[ht.

תכ]סֹה]	1
ת]כסֹה ת]שע	2
ת]כסה עש]ר	3
[בו תכסה ע]שתי עשרא	4
•[בו תכסה שתי]מ עשרא	5
[בו תכסה של ו]ש עשרא	6
•[בו תכסה ארבע] עשרא	7
א]אחד בו תמשול א]ורה	8
הר]קיע <ארבע עשרא וח]צי> ובבוא השמ]ש	9

bottom margin

NOTES ON READINGS

L. 8 תמשול א]ורה. The *SE*'s "אורה" *vacat?* "תמשול" is a misreading. What follows תמשול is not a blank space for at least two letters can be read there and they are most likely to be the first two letters of the word restored in the *SE* as the missing word, אורה. Wise¹¹ resorts to using this line to support his suggested reading in 1 ii 7, where he restores כול after תמשול. At first glance the letter in question does look like a כ for what can clearly read of the remnant of the letter is a small flattened circle at the upper part of the space. A detailed examination shows that it is rather an א(𐤀) than a כ(𐤁). On the left hand side of the small circle the written strokes can be seen cutting across each other, a feature not found with the other כ. Furthermore, the characteristic slash to the left of the א can also be faintly seen of the letter. Therefore the word following תמשול is most likely to start with a א, which supports the restoration suggested by Milik.

TRANSLATION

1. it cov]ers[

¹¹ Wise, "Second Thoughts", 113, n. 35.

2. it c]overs n[ine
3. it c]overs te[n
4.] of it, it covers e[lven
5.]· of it, it covers twe[lve
6.]of it, it covers thir[teen
7.]· of it, it covers four[teen
8.]first of it, it rules it li[ght
9. the s]ky. <fourteen and a ha[lf> And when the su[n] comes[

COMMENTS

The editors of the *SE* restore this fragment to cover a period of the fourteenth to the twenty-first of a certain month. In three different lines they indicate that the number of the day of the month can be partially read: ר[בשמונה עש] (line 5), [בעשרי]ם (line 7), and [בעשרים ו]אחד (line 8). Without showing the degree of certainty of their readings, it is difficult to know whether the editors are correct. Examining the photograph of the fragment can only confirm that the ך in line 8 is certain while all the other letters read in the *SE* are entirely conjectural. Although the restoration of the fragment in the *SE* has no significant implication for the understanding of the text as a whole, building it up from a few uncertain letters is unwise. Only minimal restoration is included in the reading here.

Frg. 4

וּכְנַ]	6
עֲשִׂי עֲרָא וְכִנְ]	7
שְׁחִי מְ עֲשָׂא וְכִנְ]	8
שְׁלוֹן שְׁ עֲשָׂא וְכִנְ ת]בּוֹא	9
אַרְבַּע]עֲשִׂי ר]א וְכִנְ ת]בּוֹא	10
לִי]וֹמ בְּתוֹכ]	11
[>אַרְבַּע]עֲשָׂא וְחֲצִי עְ] <.... אֲזָרָה לְהַכֹּסוֹת	12
אַרְבַּע לְשַׁבַּת]	13

bottom margin

TRANSLATION

6.]and so[
7. elev]en, and so[
8. tw]elve, and so[
9. thir]teen, and so it[enters
10. four]teen, and so it[enters
11. for a d]ay in the midst [
12. <four]teen and a half '[>].... its light to be cov[ered
13.]fourth of the week[
14.]it reveals o[ne] part[

COMMENTS

This fragment is not included in the SE.

4Q319. 4QOtot (olim 4QS^b)

(PLATES III-V)

Bibliography: J. T. Milik, (ed.), *The Book of Enoch, Aramaic Fragments of Qumrân Cave 4* (Oxford: Clarendon, 1976) 62; J. T. Milik, "Écrits Préesséniens de Qumrân," in M. Delcor (ed.), *Qumrân, sa piété, sa théologie et son milieu* (Leuven: Leuven University Press, 1978) 93; B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 96-98; U. Glessmer, "Der 364-Tage-Kalender und die Sabbatstruktur seiner Schaltungen in ihrer Bedeutung für den Kult," in D. R. Daniels, U. Glessmer, and M. Rösel (ed.), *Ernten, was man sät: Festschrift K. Koch zu seinem 65. Geburtstag* (Neukirchen-Vluyn: Neukirchener Verlag, 1991) 379-398; M. Albani, "Die lunaren Zyklen im 364-Tage-Festkalender von 4QMischmerot/4QS^c," *Forschungsstelle Judentum. Mitteilungen und Beiträge* 4 (1992) 3-47; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 130-133; U. Glessmer, "Investigation of the Otot-text (4Q319) and Questions about Methodology," in M. O. Wise, N. Golb, J. J. Collins, and D. G. Pardee (ed.), *Methods of Investigation of the Dead Sea Scrolls and the Khirbet Qumran Site: Present Realities and Future Prospects* (Annals of the New York Academy of Sciences 722; New York: New York Academy of Sciences, 1994) 429-440; U. Glessmer, "The Otot-Texts (4Q319) and the Problem of Intercalations in the Context of the 364-Day Calendar," in H.-J. Fabry, A. Lange, and H. Lichtenberger (ed.), *Qumranstudien: Vorträge und Beiträge der Teilnehmer des Qumran-seminars auf dem internationalen Treffen der Society of Biblical Literature, Münster, 25-26. Juli 1993* (Schriften des Institutum Judaicum Delitzschianum 4; Göttingen: Vandenhoeck and Ruprecht, 1996) 124-164; F. García Martínez, "Calendarios en Qumran," *Estudios Bíblicos* 54 (1996) 345-348; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 307-309; F. García Martínez and E. J. C. Tigchelaar, (eds.), *The Dead Sea Scrolls Study Edition, Volume One, 1Q1-4Q273* (Leiden: Brill, 1997) 526-537; P. S. Alexander and G. Vermes, *Qumran Cave 4.XIX: 4QSerekh Ha-Yahad and Two Related Texts* (DJD 26; Oxford: Clarendon, 1998) 129-152

Fragments

4QOtot does not occupy a scroll of its own but shares the parchment with a copy of the *Rule of the Community* (4QS^c). The *Rule of the Community* contains the first three and a half columns of the composite fragment 1 of the manuscript (4Q259 + 4Q319), thus the *Otot*-text is so designated as beginning with 1 iv 10. Although the two works are labelled with separate sigla and regarded in general as two independent works, their link can still be discerned on the plates containing their fragments. In PAM 43.283, one of the final photographs of 4Q319, four small fragments can be

seen loosely placed at the top right corner. These small pieces form no part of the *Otot*-text but contain lines which are equivalent to 1QS 9:21-24, a continuation to the fragments in PAM 43.263 of 4Q259. The *Otot*-text starts with the lower half of the column containing these pieces with only a few lines missing in between which might contain a blank space separating the two works.¹²

Hundreds of fragments are identified with 4Q319, but most of them are very small. These unidentified fragments are mainly grouped in the last two photographs, PAM 43.285 and 43.286. Other than the extensive composite fragment 1 only four relatively larger fragments are included in this study.

Fragment 1 is a composite identification of text with many individual small fragments, some of which are even totally isolated from the others without any physical contact at all. That they can be identified and so placed is mainly because of the regularity of the text. This extensive fragment covers a span of four columns, and judging from the content there should be nineteen lines in each of these columns. No upper margin is preserved but the lower margin for some columns can be seen. Column 4, excluding the upper section which contains the lines from the *Rule of the Community*, has 10 lines with approximately one hundred eighty-five identified characters. Both column 5 and column 6 have eighteen preserved lines with approximately three hundred and two hundred eighty-three identified characters respectively. For column 7 no upper or lower margin is found but only a few letters at the beginning of seven lines, which makes up a total of about thirty characters.

Fragment 2 is a small fragment with only four lines of twenty-seven characters. Due to a crease the left hand side of some of its lines are skewed downward and look as if they are not in alignment with the rest of the lines. Fragment 3 is even more obscure with only two lines of fifteen characters which can be read on its lower right portion. On the right hand side are unidentified traces of written marks. Fragment 4 is a narrow fragment containing five lines of twenty-nine letters. Fragment 5 is small but due to the margin sited in the middle of it two columns can still be

¹² For the discussion on the relative position of the two works in this manuscript and the possible restoration of the lines between them see Glessmer, "The *Otot*-Texts," 123-129; and S. Metso, "The Primary Results of the Reconstruction of 4QS^e," *Journal of Jewish Studies* 44 (1993) 303-308.

identified. The right hand column has the end of five lines preserved with a total of approximately twenty-three characters. The left hand column shows traces of the beginning of four lines with only six readable characters.

Palaeography

This manuscript, although having its own title and cave number, was copied together with 4QSerekh-ha-Yahad° (4Q259) in the same manuscript by the same scribe. The hand of this scribe is described by Cross as “an unusual Jewish Semicursive with mixed Semicursive and Semi-formal script features”, and is dated to the period of 50-25 BCE.¹³

Line Correspondence Chart

Proposed			<i>Preliminary Edition</i>			Milik ¹⁴
Frg.	Col.	Lines	Frg.	Col.	Lines	
1	iv	10-19	1	v	10-19	\
1	v	1-19	1	vi	1-19	| v 10-vii 19
1	vi	1-19	1	vii	1-19	/
1	vii	1-7	1	viii	1-7	viii 1-7
2		1		n/a		\
2		2-4	2		2-4	|
	n/a		3	i	3	| viii 7-18
	n/a		4		3	|
	n/a		5	i	3	|
	n/a		5	ii	3	/
3		1-2	7		1-2	\
4		1-4	8		1-4	| viii 18-ix 19
4		5		n/a		/
5	i	1-2	9	i	1-2	\

¹³ Information cited from P. S. Alexander and G. Vermes, *Qumran Cave 4.XIX: Serekh Ha-Yahad and Two Related Texts* (DJD 26; Oxford: Clarendon, 1998) 133.

¹⁴ Milik has proposed an overall structure for the then 4Q260 (now 4Q259 + 4Q319) in “Écrits Préesséniens de Qumrân,” in M. Delcor (ed.), *Qumrân, sa piété, sa théologie et son milieu* (Leuven: Leuven University Press, 1978) 91-106, 93. As these column and line numbers are still occasionally referred to they are included in the line correspondence chart for reference.

5	i	3-5	9	ii	2-4	x 2ss
5	ii	1		n/a		
5	ii	2-4	9	ii	2-4	/
Concluding Passage 4-8				n/a		xi 4-8

Mus. Inv. 683, 695, 696, 708

PAM 41.346, 41.348, 41.479, 41.979, 42.420, 42.421, 42.422, 42.863, 43.228, 43.229, 43.230, 43.231, 43.283, 43.284, 43.285, 43.286

Frg. 1 iv

•[	[ אורה בארבעה בשב]ת	10
ה]בריאה בארבעה בג]מול אות שכניה ברביעית אות גמול בשמטה אן]ת		11
שכניה בשלי]שית אֹת] גִּמּוֹל בשִׁית אות [שכניה בשנית אות ג]מול		12
[בחמישית אן]ת שכניה אחר השמטה אות גִּמּוֹל ברביעית אות שכ]נ[י]ה		13
[בשמטה אן]ת גמול בשליש]ת את שכניה [בששית אות גמ]ול		14
[בשנית אן]ת שִׁכְנִיָּה [בְּחִמִּישִׁית אות גמול אחר השמט]ה אות		15
[שכניה בר]ביעית אֹת גמול בשמטה אות סֹף היובל השני אתות הי]ובל		16
[השני] אתות אֶחָד מזה בשמטה אתות] /// •[הבר]י[אה]		17
ה] שכ]נ[י]ה בשנה השלישית אות גמול בששית א]ות שכניה		18
[בשנית אות ג]מול בְּחִמִּישִׁית אות שכניה אחר הש]מטה אות ג]מול		19

NOTES ON READINGS

L. 17 /// אתות] 2. The *PE* has “2]אתות”. Why the editors restored the number for the “signs on the release” in this jubilee cycle as 2 is not known. The number should no doubt be 3 as entries for the signs which fall on the release year can be found in lines 11, 13-14, and 16 of the same column.

L. 18 ה]. The editors of the *PE* convert the reading ה] of the *PC* to ה]א. Restoring אות in front of שכניה may seem to be a reasonable reconstruction as the two words do appear together in the text most of the time, but here is not the case. Only the last letter of the word survives and it is badly damaged. The remnant of the letter cannot be identified definitely with any letter, but is certainly not a ת. What is left of the letter is its top left hand corner where the initial bit of a broad horizontal stroke is

extant. This remaining part resembles several letters but not a ת, which would have a vertical stroke instead in the extant portion of the letter.

TRANSLATION

10. [] its light in the fourth of the we[ek]·
11. [the] creation on the fourth of G[amul, a sign; Shecaniah in the fourth, a sign; Gamul on the release, a sig]n;
12. [Shecaniah in the thi]rd, a sign; [G]amul in the sixth, a sign; [Shecaniah in the second, a sign; G]amul
13. [in the fifth, a sig]n; Shecaniah after the release, a sign; Gamu[l in the fourth, a sign; Sheca]n[ia]h
14. [on the release, a sig]n; Gamul in the thi[r]d, a sign; Shecaniah [in the sixth, a sign; Gam]ul
15. [in the second, a sig]n; Sh[ecaniah] in the fifth, a sign; Gamu[l after the relea]se, a sign;
16. [Shecaniah in the fo]urth, a sign; Gamul on the release, a sign; e[nd of the second jubilee. The signs of the j]ubilee
17. [the second:] 17 signs, from which [3] signs on the release. []· the creation
18. []h Sheca[ni]ah in the third year, a sign; Gamu[l in the sixth, a si]gn; Shecaniah
19. [in the second, a sign; G]amul in the fifth, a sign; Shecaniah after the re[lease, a sign; G]amul

Frg. 1 v

[ברביעת אות שכניה בשמטה אות גמול בשלישית אות שכניה]	1
[בששית אות גמול ב]שנ[י]ת א[ות שכניה בחמישית אות גמול]	2
[אחר השמטה]ה אות שכניה בר[ביעת אות גמול בשמטה אות]	3
[שכניה בשלישית אות גמול בששית אות]...[סוף]	4
היובל השיל[ני]ש אֶתֹות היובל [השלישי אתות -]// מזה בשמטה	5

אתות // שכניה [בשנה השנית או]ת [גמול]ל בחמישית אות שכניה	6
אחר השמטה או]ת גמול ברביעית או]ת שכניה בשמטה אות	7
גמול בשלישית אות [שכניה בששית אות ג]מול בשנית אות	8
שכניה בחמ>י שית אות [גמול אחר] השמטה אות שכניה	9
ברביעית אות גמול [בשמטת אות] שכניה בשלישית אות גמול	10
בששית אות שכ[ניה בשנית אות] גמול בחמישית אות שכניה	11
אחר השמטה או]ת סוף היובל הרביעי אתות [היובל] <הרביעי] אתות -////////	12
[מזה] בשמטה <אותות> // ג]מול [בשנה הרביעית אות שכניה	13
[בשמטה אות גמול [בשלישית אות שכניה בששית אות גמול]	14
בשנ[ית]ת אות שכניה בחמ]ישית אות גמול אחר השמטה אות שכניה	15
ברביעית אות [ג]מול [בשמטה אות שכניה בשלישית אות גמול]	16
בשש[ית]ת או]ת ש[כניה בשנית אות גמול בחמישית אות שכניה]	17
[אחר ה]שמטה אות ג]מול ברביעית אות שכניה בשמטה אות סוף]	18
[היובל החמיש]י בישיב אב [אתות היובל החמשי אתות -//////// מזה בשמטה]	19

NOTES ON READINGS

L. 12 <היובל>. The PC's entry of the word <היובל> is changed to <הרביעי> in the PE. Yet a careful study shows that the reading in the PC for this superlinear word is closer to the extant writing than the one proposed in the PE.

L. 19 בישיב אב. Although the two letters, אב, are slightly separated from the preceding letters, it is certain that they should be connecting with each other forming a single word containing the priestly name Jushebeab.

TRANSLATION

- [in the fourth, a sign; Shecaniah on the release, a sign; Gamul in the third, a sign; Shecaniah]
- [In the sixth, a sign; Gamul in the] sec[on]d, a s[ign; Shecaniah in the fifth, a sign; Gamul]
- [after the relea]se, a sign; Shecaniah in the f[ourth, a sign; Gamul on the release, a sign;]
- [Shecaniah in the thi]rd, a sign; Gamul in the si[xth, a sign;] ... [end of]

5. the th[ir]d jubilee. The signs of the [third] jubilee: 1[6 signs,] from which
6. 2 signs on the release. Shecaniah [in the second year, a sig]n; [Gamul]l in the fifth, a sign; Shecaniah
7. after the release, a si[gn; Gamul in the fourth, a sig]n; Shecaniah on the release, a sign;
8. Gamul in the third, a sign; [Shecaniah in the sixth, a sign; G]amul in the second, a sign;
9. Shecaniah in the fifth, a sign; [Gamul after] the release, a sign; Shecaniah
10. in the fourth, a sign; Gamul [on the release, a sign,] Shecaniah in the third, a sign; Gamul
11. in the sixth, a sign; Sheca[niah in the second, a sign,] Gamul in the fifth, a sign; Shecaniah
12. after the release, a si[gn; end of the fourth jubilee. The signs of the fourth] <jubi]lee>: 17 signs,
13. [from which] 2 <signs> on the release. G[amul] in the fourth year, a sign; Shecaniah
14. [on the r]elease, a sign; Gamul [in the third, a sign; Shecaniah in the sixth, a sign; Gamul]
15. in the sec[on]d, a sign; Shecaniah in the fif[th, a sign; Gamul after the release, a sign; Shecaniah]
16. in the fourth, a sign; [Ga]mul on the [release, a sign; Shecaniah in the third, a sign; Gamul]
17. in the six[th, a s]ign; Sh[ecaniah in the second, a sign; Gamul in the fifth, a sign; Shecaniah]
18. [after the] release, a sign; G[amul in the fourth, a sign; Shecaniah on the release, a sign; end of]
19. [the fifth jubilee] in Jushebeab. [The signs of the fifth jubilee: 16 signs, from which]

COMMENTS

L. 4 [סוף] ...]. The reading and restoration in the *PE* for the latter half of the line, [בש]שית אות[שֶׁכֶּנִי הַבְּשִׁיטָה בְּשִׁנִּית אֹת סוף], is adopted in most other studies. However, this reading is both uncertain and problematic. The word שכניה has not a single letter that can be verified from the preserved writings. Some traces of marking are found, yet they are no more than a few nib marks which cannot be identified with any letters. The proposed restoration in the *PE* is problematic because it assumes a scribal error in counting the same entry, שכניה בשנייה אות, twice at the end of this jubilee cycle and at the beginning of the next. Unless the restoration is supported by a more definite reading, it is better to accept the loss of some irretrievable material than to ascribe a mistake to the ancient scribe.

L. 19 /////- אתות. There are variations to the reconstruction of these words in the various studies. The word אתות in front of the number is omitted by the *PE*. The editors of the *SE* modify this by putting back the missing word, but they also change the number from 16 to 17,¹⁵ an unwarranted change. According to the theoretical scheme this jubilee cycle should indeed have seventeen signs, but the text does not necessarily follow the scheme exactly. The number of signs stated in the summary of the last jubilee cycle also shows deviation from the theoretical calculation. The actual number of signs in the text preceding this summary is undoubtedly sixteen.

Frg. 1 vi

[אתות /// גמול בשנה השלישית אות שכניה בששית אות]	1
[גמול ב]שִׁנִּית א[ות] שכניה ב[חמישית אות גמול אחר השמ]טה	2
אֹת שכניה ברביעית אות גמול ב[שמטת אות שכניה] בשלישית	3
אות גמול בששית אות שכניה [בשנייה אות] גמול	4
בח[מי]שית אות שכניה אחר [השמטה] אות	5
גמול[ל בר]ביעית אות שכניה בשמ[טה] אות גמול ב[שלישית]	6

¹⁵ Similarly, the same alternation is made in F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 327-348 and 523-552, 345-348.

אות] שכניה בש[שית <אות> סוף [היובל הששי אתות]	7
יובל [הששי אתות -] // מזה ב[שמטה א]תות // []	8
הח[] גוים[]	9
וליוב[ל] גמול בשנה השנית אות שכניה בחמישית אות גמול אחר[	10
השמט[ה] אות שכניה ברביעי[ת] אות גמול[ל] ב[שִׁמְטָה]	11
[אות שכניה בשלישית אות] גמול בששית אות[ת] שכניה	12
[ב]שנית א[ות] גמול[] בחמישית אות שכניה [אחר]	13
הִשְׁמַטָּה] אות ג[מול] ברביעית אות שכניה בְּשִׁמְטָה אות]	14
גמול [בשלישית] אות שכניה בששית אות[] גמול]	15
בשִׁנִּית אות שכניה] בחמישית אות סוף היובל[ל] ה[שְׁבִיעִי	16
[אתות היובל ה[שביעי אתות -] // מזה ב[שִׁמְטָה]	17
[אתות //] אות היובל[ים] ש[נת] יובלים לימ[ני]	18
[] במימן השלישי י[]	19

TRANSLATION

1. [3 signs on the release. Gamul in the third year, a sign; Shecaniah in the sixth, a sign;]
2. [Gamul in the] second, a si[gn]; Shecaniah in the [fifth, a sign; Gamul after the rel]ease
3. a sign; Shecaniah in the fourth, a sign; Gamul on the [release, a sign; Shecaniah] in the third
4. a sign; Gamul in the sixth, a sign; Shecaniah [in the second, a sign;] Gamul
5. in the f[if]th, a sign; Shecaniah after [the release], a sign;
6. Gamu[l in the fo]urth, a sign; Shecaniah on the rele[ase, a sign; Gamul in the] thi[r]d
7. a sign; [Shecaniah in the si]xth, <a sign>; end of the [sixth jubilee. The signs of]
8. [the sixth] jubilee: 1[6 signs,] from which 2 signs on the [release.]
9. *hh*[]nations[]
10. and for the jubi[lee. Gamul in the second year, a sign; Shecaniah in the fifth, a sign; Gamul after]

11. the relea[se, a sign; Shecaniah in the four]th, a sign; Gamu[l on the] relea[se]
12. [a sign; Shecaniah in the third, a sign;] Gamul in the sixth, a sig[n; Shecaniah]
13. [in the] second, a sig[n; Gamul] in the fifth, a sign; Shecaniah [after]
14. the relea[se, a sign; G]amul in the fourth, a sign; Shecaniah on the re[lease, a sign;]
15. Gamul [in the thi]rd, a sign; Shecaniah in the sixth, a sign; [Gamul]
16. in the sec[ond, a sign; Shecaniah] in the fifth, a sign; end of [the] seventh jubi[lee.]
17. [The sign of the] seventh [jubilee]: 16 signs, from which
18. [2 signs] on the re[lea]se.[] sign of the j[u]bilees, [ye]ar of the jubilees according to the [days of]
19. []in Mijamin the third y[]

Frg. 1 vii

גמול]	1
ידעיה]	2
מִיָּמִין פֶּתַח־יָהּ.	3
שְׁכַנְיָה דֶּלְיָהּ	4
יְשִׁבְעָב]	5
הַפְּצִיז הַקּוֹץ	6
גמול]	7

TRANSLATION

1. Gamul[
2. Jedaiah[
3. Mijamin, Pethah[iah
4. Shecaniah, Del[aijah
5. Jushebeab, [
6. Happizzetz, H[akkoz
7. Gamul[

COMMENTS

Taking this section as a parallel to what is in 4Q328 1, and 4Q329 1-2, the first six lines are restored entirely in the *SE* as a list of the priestly families heading the quarters of the years in the sexennial cycle. Based on the initial word preserved in these lines the assumption seems to be reasonable, but the restoration is not without problems. Although the content of the sections in the other two calendrical documents is basically similar, their presentation is not quite the same - one has the order of the year preceding the priestly names and the other has it the other way round. Here the temptation to restore the lines in full according to either of the styles should be resisted.

Frg. 2

ח[פֿה חז[יר ג]מ[ול]	1
[>ב<ל[ג]ה פתחיה מע[זיה]	2
יר[עִה השלישית מ[ימן]	3
] שעור[ים אביה]	4

TRANSLATION

1. H]uppah, Hez[ir, G]am[ul
2. Bi]l[g]ah, Pethahiah, Maa[ziah
3. Jed]aiah. The third (year): Mi[jamin [
4. Seor]im, Abijah [

COMMENTS

The entire first line and the last word in both lines 2 and 3 are added to the reading of the *PE*. Based on the assumption that what is in this fragment is a list of the priestly names heading the months in each year, a few more letters can be identified in the photographs. The identification of these letters in return confirms the assumption.

Frg. 3

בי[שוע חג השבון]עים	1
ביוירי]ב יום הכפור[ים	2

TRANSLATION

- 1. in Je]shua the Feast of Wee[ks
- 2. in Jehoiari]b the Day of Atonement [

Frg. 4

הפסח [השני בי[ויריב	1
יום הזכ[רון בְּחִזְרָ]]	2
[מַעֲדֵיָהּ בְּ]	3
במ[עוזיה הפסח]	4
[יום הזכר[ון	5

TRANSLATION

- 1.]the second [Passover] in Je[hoiarib
- 2. the Day of Reme]mbrance in Hezir [
- 3.]its festivals: in [
- 4. in] Maaziah the Passover [
- 5.]Day of Remembra[nce

COMMENTS

When compared to the *PE*, several modifications are made to the reading of this fragment. (1) The last word of line 1 is restored. (2) The first two words in line 2 are reconstructed in addition to the first two identifiable letters. (3) Line 3 is reinstated which is omitted entirely in the *PE*. What is recorded in this fragment, and also fragment 3, is a list of festivals with their corresponding priestly courses in the six year cycle, a chart similar to the section in 4Q320 iv except with the omission of the weekdays.

Frg. 5 i

גמ]ו ל מימן	1
יד]עיה שכניה	2
שכניה [	3
שכניה [	4
שכניה [	5

NOTES ON READINGS

L. 2-4. These lines are misplaced to fragment 9 column ii in the *PE*.

TRANSLATION

1. Gam]ul Mijamin
2. Jeda]iah Shecaniah
3.] Shecaniah
4.] Shecaniah
5.] Shecaniah

Frg. 5 ii

עש]ר	1
גמ]ול	2
כי א	3
]•[	4

TRANSLATION

1. te[n
2. Gam[ul
3. for]
4.]•[

The Concluding Passage of the Manuscript

ם [ול]שבתות	4
ימיה]ם [ול]חג[ני	5
ימי]הם [ול]ח<ו>דש[ני שניהם ו]לאותות	6
ש[ממ]יה]ם וליובליהם בשבת	7
בני [גמו]ל בי[ו]ם הרבי[עי]	8

TRANSLATION

4.]m [and for the] weeks
5. [of their da]ys, [and for the] fea[ts]
6. of their [days, and for the] month[s of their years, and] for the signs
7. [of their re]leases, and for their jubilees in the week
8. [of the son]s [of Gamu]l in the four[th d]ay.

COMMENTS

The passage is quoted by Milik in his 1978 article “Écrits préesséniens de Qumrân” as the last column and concluding section of this manuscript.¹⁶ Yet, the entire cited section cannot be found on the final photographs PAM 43.283-6. It is included here simply for reference.

¹⁶ Milik, “Écrits préesséniens”, 93.

4Q320. 4QCalendrical Doc A (Mishmarot A)

(PLATES VI-VIII)

Bibliography: J. T. Milik, "Le travail d'édition des manuscrits du désert de Juda," Volume du Congrès Strasbourg 1956 (Supplements to Vetus Testamentum 4; Leiden: Brill, 1957) 25; B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 60-67; M. Albani, "Die lunaren Zyklen im 364-Tage-Festkalender von 4QMischmerot/4QS^e," *Forschungsstelle Judentum. Mitteilungen und Beiträge* 4 (1992) 3-47; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 118-119; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 309-311; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 523-529; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 50-128; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 678-683.

Fragments

Based on the structural content of the text, various pieces of this manuscript can be put together to form larger fragments. Altogether there are nine fragments identified. Fragment 1 is a composition of two separated pieces. Their relative position can be determined according to their contents. Together they have three columns. Fourteen lines can be seen in the first column, thirteen in the second, and only six in the third. It has approximately three hundred and seventy-seven recognisable characters and fifty-six cipher numbers. Fragment 2 is a single fragment with two columns. Column 1 has six lines and column 2 has seven, but all the lines have only one or two words. The number of characters on it is sixty-seven and the number of cipher numbers is three. Fragment 3 has only the last three letters of a line on it. However, because a possible reconstruction of these letters is one of the priestly names and a line ending with a priestly name may be located after fragment 2, this minute fragment is hence placed there and designated as fragment 3. Fragment 4 is a combination of several pieces, some of which are touching one another and some of which are separated. Together they form the largest fragment of the manuscript with a total of six columns, although each column is rather narrow. Judging from the content, the columns should have about fourteen lines and column 3 has part of all the fourteen lines extant. Only four

can be seen in column 1, five in column 2, ten in column 4, thirteen in column 5, and ten in column 6. Altogether it has approximately four hundred and ninety characters and twenty-four cipher numbers. Fragments 5 to 9 are all very small pieces and their exact location cannot be identified. Fragment 5 has two lines and nine characters; fragment 6 has four lines, sixteen characters, and one number; fragment 7 has one number and two characters; fragment 8 has five characters; and fragment 9 has six characters.

Palaeography

Judging by the criteria established by Cross, the handwriting of this manuscript best fits the characteristics of the formal hand from the late Hasmonean or early Herodian period.¹⁷ Thus 4Q320 may be dated to ca. 50-25 BCE.

Mus. Inv. 681, 682
PAM 40.579, 40.587, 40.591, 40.611, 40.619, 41.699, 41.700, 42.329, 42.330, 43.330, 43.331

Frg. 1 i

<i>top margin</i>		
	[להראותה מן המזרח]	1
	[ו] לאִירָה [ב]מחצית השמים ביסוד	2
	[הרק] עֵ מֵעֵרֵב עֵר בוקר ב//// בשבת	3
	[בני ג]מֹול vacat לחודש הרישון בשנה	4
	הרישון[נָה vacat	5
	[ב]//// בירעי[ה ל'////// 3- בצ- בו	6
	[שבת ב]קוץ לצ- בצ- בשני	7
	[ב/ באלי]שיב ל'////// 3- ב////// 3- בשלשי	8
	[ב]//// בבלג[ה לצ- ב////// 3- ברביעי	9

¹⁷ F. M. Cross, “The Development of the Jewish Scripts” in G. E. Wright (ed.), *The Bible and the Ancient Near East: Essays in Honor of William Foxwell Albright* (London: Routledge & Kegan Paul, 1961) 133-202, 138, Figure 2, line 3.

[ב] /// בפת[חִיָּה ל' / 3] ב' / 3] בחמשי	10
[ב] /// בדליה] לז- ב' / 3] בששי	11
[שבת בשערי]ם ל' / 3] ב' / 3] בשביעי	12
[ב] /// באביה ל' [ז- ב' / 3] בשמני	13
[ב] /// ביקים ל' / 3] ב' / 3] בתשיעי	14

bottom margin

NOTES ON READINGS

L. 2 לאִירָה [ן]. The reading of the word is not certain. The restoration is based on formal and semantic considerations to the paralleled להראותה in line 1.

L. 6 בו. Instead of the letter ו the *PE* puts the numeral “1” next to the ב. The number might well seem to represent the first month, but it does not agree with the writing. The mark following the ב is not a simple single down stroke denoting the cipher 1 but one with a little bend to the right at the top signifying a letter ו. The first month is already mentioned in line 4, so there is no need to repeat the number again here but rather it refers back to the mentioned month by using the 3ms suffix.

L. 9 [ב] /// בבלג[ה לז- ב' / 3] . The two numbers in this line have been changed by the editors of the *PE* from 4 and 29 of the *PC* to 3 and 28. According to the scheme used by the text to calculate the events there is no doubt that the numbers should be 3 and 28. However, while the first number is lost, the second number can be clearly read as 29. The scribal error is rectified by the *PE* without giving any indication.

TRANSLATION

1.]to show it from the east.
2. [And] to cause it to shine [in] the middle of the sky, on the foundation of
3. [the firmamen]t, from evening till morning on the 4 of the week of
4. [the sons of G]amul, *vacat* for the first month in the
5. [firs]t year; *vacat*
6. [on the 5 of Jedaia]h after 29 (days) on the 30 of it;

7. [sabbath of Ha]kkoz after 30 (days) on the 30 of the second (month);
8. [on the 1 of Elia]shib after 29 (days) on the 29 of the third (month);
9. [on the 3 of Bilga]h after 30 (days) on the 29 of the fourth (month);
10. [on the 4 of Petha]hiah after 29 (days) on the 27 of the fifth (month);
11. [on the 6 of Delaiah] after 30 (days) on the 27 of the sixth (month);
12. [sabbath of Seori]m after 29 (days) on the 25 of the seventh (month);
13. [on the 2 of Abijah after] 3[0 (days) on the] 25 of the eighth (month);
14. [on the 3 of Jakim after 2]9 (days) on the 24 of the ninth (month);

COMMENTS

Throughout the three columns of fragment 1 the preposition ל in the middle of the entries accompanying the number 29 or 30 is taken as “at the close of a certain period”, and hence is translated as “after”.¹⁸

Frg. 1 ii

top margin

באמר <ל> ב 3// בעשירי	1
ביחזקאל ל 3//////// ב 3// בעשתי עשר	2
ב/ בייריב ל<3> ב 3// בשנים עשר החדש	3
השנה השנית	4
vacat	
ב/ במלכיה ל 3//////// ב 3// ברישון	5
ב/ בישוע ל<3> ב 3// בשני	6
ב/ בחופא ל 3//////// ב- 3//////// [בשלישי]	7
שבת בפצצ ל<3> ב- 3//////// בר[ביעי]	8
ב/ בגמול ל 3//////// ב- 3//////// [בחמשי]	9
ב/ בידעיה ל<3> ב- 3//////// [בששי]	10
ב/ במימן ל 3//////// ב- 3//////// [בשביעי]	11
ב/ בשכניה ל<3> ב- 3//////// [בשמיני]	12

¹⁸ For this usage of the preposition see *The New Brown-Driver-Briggs-Gesenius Hebrew-English Lexicon*, 517, 6b; and the *Hebrew & Aramaic Lexicon of the Old Testament: The New Koehler.Baumgartner in English* (Leiden: Brill, 1994) v. 2, 508, 3c.

שבת בבל[גה ל'/////////3 ב-//// בתשיעי] 13

[ב// בפתחיה ל3- ב-//// בעשירי] 14

NOTES ON READINGS

L. 1 <באמר>. The word was omitted accidentally but replaced superlinearly by the corrector.

TRANSLATION

1. on the 5 <of Immer> after 30 (days) on the 23 of the tenth (month);
2. on the 6 of Jehezkel after 29 (days) on the 22 of the eleventh (month);
3. on the 1 of Jehoiarib after 30 (days) on the 22 of the twelfth month;
4. the second year: *vacat*
5. on the 2 of Malchijah after 29 (days) on the 20 of the first (month);
6. on the 4 of Jeshua after 30 (days) on the 20 of the second (month);
7. on the 5 of Huppah after 29 (days) on the 19 [of the third (month);]
8. sabbath of Happizzez after 30 (days) on the 18 of the f[ourth (month);]
9. on the 1 of Gamul after [29 (days) on the 17 of the fifth (month);]
10. on the 3 of Jedaiah after 30 (days) [on the 17 of the sixth (month);]
11. on the 4 of Mijamin after 2[9 (days) on the 15 of the seventh (month);]
12. on the 6 of Shecaniah after 3[0 (days) on the 15 of the eighth (month);]
13. sabbath of Bil[gah after 29 (days) on the 14 of the ninth (month);]
14. [on the 2 of Pethahiah after 30 (days) on the 13 of the tenth (month);]

Frg. 1 iii

[ב// בדליה ל'/////////3 ב-//// בעשתי עשר החדש] 1

[ב// בחרים ל3- ב-//// בשנים עשר החדש] 2

[השנה השלישית ב//// בקוץ ל'/////////3 ב- ברישון] 3

[ב/ ביקים ל3- ב- בשני] 4

[ב// באמר ל'/////////3 ב-//// בשלישי] 5

[ב// ביחזקאל ל3- ב-//// ברביעי] 6

[ב]//// במעזיה ל'//////// 3 ב'////// בחמשי]	7
[שבת במלכיה ל3- ב'////// בששי]	8
ב/ ב' [שוע ל'//////// 3 ב'////// בשביעי]	9
ב// בחפא ל3- ב'////// בשמ ינ'	10
ב//// בחזיר ל'//////// 3 ב'////// בתשיעי]	11
ב////// ביכין ל3- ב'////// בעשירי]	12
שבת בידעיה ל'//////// 3 ב'////// בעשתי עשר החדש]	13
ב' [במימ]ין ל3- ביום שנים בשנים עשר הח'ש]	14

TRANSLATION

1. [on the 3 of Delaiah after 29 (days) on the 12 of the eleventh month;]
2. [on the 5 of Harim after 30 (days) on the 12 of the twelfth month;]
3. [the third year: on the 6 of Hakkoz after 29 (days) on the 10 of the first (month);]
4. [on the 1 of Jakim after 30 (days) on the 10 of the second (month);]
5. [on the 2 of Immer after 29 (days) on the 9 of the third (month);]
6. [on the 4 of Jehezkel after 30 (days) on the 8 of the fourth (month);]
7. [on the 5 of Maaziah after 29 (days) on the 7 of the fifth (month);]
8. [sabbath of Malchijah after 30 (days) on the 7 of the sixth (month);]
9. on the 1 of Je[shua after 29 (days) on the 5 of the seventh (month);]
10. on the 3 of Huppah after 30 (days) on the 5 of the eighth (month);
11. on the 4 of Hezir after 29 (days) on the 4 of the ninth (month);
12. on the 6 of Jachin after 30 (days) on the 3 of the tenth (month);
13. sabbath of Jedaiah after 29 (days) on the 2 of the eleventh month;
14. on the 2 [of Mijam]in after 30 (days) on the second day of the twelfth month.

COMMENTS

L. 3 השנה השלשית. The phrase השנה השלשית is not in the *PE*. When the text comes to the second year an introductory phrase about the year order, which takes up a whole line in ii 4, is needed to indicate the change from year one to year two. The changing point from year two to three is lost, but judging from what is at the

beginning of year two a similar introductory phrase seems to be required at this point of the text. However, two features of the manuscript put a constraint on the restoration of the year order at this point. First, all the columns that can be reasonably reconstructed have fourteen lines, so this column is unlikely to have more lines than fourteen. Second, all the extant entries show that the manuscript is confined to the rule of having one entry per line. Keeping to these features the number of missing lines in this column does not allow one to restore a whole line for this introduction as in the case of the second year. There are few possible solutions to this problem:

- (1) The choice of the *PE* editors is to ignore the introductory phrase for the third year altogether by putting the first entry of the year immediately after the end of the second year.
- (2) Eisenman and Wise¹⁹ opt for putting the year order in a line of its own resulting in this column having fifteen lines .
- (3) Snyder's suggestion²⁰ is to put the phrase at the beginning of line 3 and to break the rule of an entry per line by putting some of the words of the first entry of the third year immediately after the introductory words. The words of the subsequent entries are then also shifted to accommodate the extra words until it reaches line 9, where the entry per line format is resumed.
- (4) Another possibility which is proposed in this study is to place both the introductory words and the first entry of the third year together in the same line. The only objection to such a proposal would be that the line would be too long when compared to the others. However, the line length in this manuscript is notably uneven which means that the concern about keeping the one entry per line style outweighs the consideration of having uniform line length. Furthermore, the proposed line is not particularly long when compared with some of the longer lines, such as line 13 and 14 in the same column.

¹⁹ Eisenman and Wise, *The Dead Sea Scrolls Uncovered*, 117-118.

²⁰ Snyder, "Mishmarot Calendars", 63.

שני הקדש	[	]	2
בְּרִיאָה קדש	[	]	3
בשבת	[/]///		4	
בני גמול	ל	רֹשׁ כל השנים	5	
שנת היובל השני	[	]	6
vacat	ת	[]	7

NOTES ON READINGS

L. 5 השנים. In order to keep a reasonable distance from the lines of the next column the final ך is written immediately underneath the י.

TRANSLATION

- 2.]· the years of holiness
- 3.] holy creation
- 4. on the] 4 of the week
- 5. [of the sons of Gam]ul is the head of all the years.
- 6. the y]ear of the second jubilee
- 7.]t vacat

COMMENTS

L. 6 שנת]. The *PE* restores at the beginning of the line שנת[ערב. This restoration is adopted by Snyder, who provides it with the translation “[through the ye]ar prior to the second jubilee”.²¹ Although the proposed restoration and interpretation are possible, the phrase and its usage find no textual support from the other calendrical texts. In addition the content of the preserved text in this fragment

²¹ Snyder, “Mishmarot Calendars”, 92. In note 55, Snyder references to Jastrow’s *Dictionary of the Targumim, Talmud Babli, Yerushalmi and Midrashic Literature* for the possible usage of the word ערב with the sense of “the year preceding a certain period”.

does not necessarily refer to the year before the second jubilee, that is the year forty-nine.

Frg. 2 ii

בִּי.]	1
בזבחי]	2
ימים]	3
קדש]	4
השני ז-] ידעיה]	5
השלשי ז-] / הקוץ]	6
הרבעי ז-] אלישיב]	7

TRANSLATION

1. b[
2. with the sacrifices of[
3. days[
4. holy[
5. the second (month), 30 (days), [Jedaiah;]
6. the third (month), 3[1 (days), Hakkoz;]
7. the fourth (month), 30 (days), [Eliashib;]

Frg. 3

שכ]ניה	1
--------	---

TRANSLATION

1. Sheca]niah;

Frg. 4 i

[התשיעי ז-] יִירָ[יב]	1
-----------------------	---

[העשירי 3- מלכיה]	2
[עשתי עשר 3- י]שוע	3
[שנים עשר 3- /] ישבאב	4

bottom margin

TRANSLATION

1. [the ninth (month), 31 (days),] Jehoiar[ib;]
2. [the tenth (month), 30 (days),] Malchijah;
3. [the eleventh (month), 30 (days), J]eshua;
4. [the twelfth (month), 31 (days),] Jushebeab;

Frg. 4 ii

הימים ולשבת	10
[ו]לחדשים vacat	11
[ול]שנים ולשממים	12
וליובלות ב////	13
בשבת בני גמול	14

bottom margin

TRANSLATION

10. the days, and for the sabbaths,
11. [and] for the months, *vacat*
12. [and for] the years, and for the releases,
13. and for the jubilees on the 4
14. of the week of the sons of Gamul.

Frg. 4 iii

השנה הרישונה מועדיה	1
ב//// בשבת בני מעוזיה vacat הפסח	2

ב/ בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר]	3
בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר] בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר]	4
בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר]	5
בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר] בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר]	6
בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר] בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר]	7
בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר] <i>vacat</i>	8
בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר] בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר]	9
<i>vacat</i>	10
הַשְּׁנִית מוֹעֲדֶיהָ	11
בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר]	12
בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר] בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר]	13
בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר] בִּידְעָ[יָה] הַנֶּף הָ[עֹמֶר]	14

TRANSLATION

1. The first year, its festivals:
2. on the 3 of the week of the sons of Maaziah, *vacat* the Passover;
3. on the 1 [of] Jeda[iah], the Waving of O[mer;]
4. on the 5 of Seorim, the [Second] Passover;
5. on the 1 of Jeshua, the Feast of Weeks;
6. on the 4 of Maaziah, the Day of Remembrance;
7. [on the] 6 of Jehoiarib, the Day of Atonement,
8. [in the] seventh [month;] *vacat*
9. [on the 4 of Jeda]jah, the Feast of Booths.
10. *vacat*
11. The second (year), its festivals:
12. on [the 3] of Seorim, the Passov[er;]
13. [on the 1] of Mija[mi]n, the Waving of [Omer;]
14. [on the 5 of A]bijah, [the Second Passover;]

ב / [בחפ] א [חג הש] בִּזְעִים	1
ב /// בשְׁעִים יום <הִזְכָּרוֹן>	2
ב ///// במלכי[ה] יום הכִּפּוּרִים	3
ב /// ב[מימין חג הסכות	4
<i>vacat</i>	5
השלישית מועדיה	6
ב /// באביה הפסח	7
ב / בשכניה הנף העמר	8
ב ///// ביק[י]ם הפסח ה[שני]	9
[ב /] בְּחִזִּיר [חג השבועים]	10
[ב /// באביה יום הזכרון]	11
[ב ///// בישוע יום הכפורים]	12
[ב /// בשכניה חג הסכות]	13
[הרביעית מועדיה]	14

TRANSLATION

1. on the 1 [of Hu]ppah, [the Feast of W]eeks;
2. on the 4 of Seorim, the Day of <Reme[mbrance;]>
3. on the 6 of Malchija[h], the Day of Ato[nement;]
4. on the [4 of] Mijamin, the Feast of Booths.
5. *vacat*
6. The third (year), its festivals:
7. on the 3 of Abijah, the Passover;
8. on the 1 of Shecaniah, the Waving of Omer;
9. on the 5 of Jak[i]m, the [Second] Passover;
10. [on the 1] of Hezir, [the Feast of Weeks;]
11. [on the 4 of Abijah, the Day of Remembrance;]

12. [on the 6 of Jeshua, the Day of Atonement;]
13. [on the 4 of Shecaniah, the Feast of Booths.]
14. [The fourth (year), its festivals:]

Frg. 4 v

ב[ביק]ם הפסח	1
ב/ [ביש]בֹּאֵב הַנֶּף הַעֲמַר	2
ב[ב] [בא]מַר הַפֶּסַח הַשְּׁנִי	3
ב/ [בי]כֹּיִן [חג] הַשְּׁבֻעִים	4
ב[ב] [ביק]ים יוֹם הַזִּכְרוֹן	5
ב[ב] [בחפא] יוֹם הַכְּפוּרִים	6
ב[ב] [בישבאב] חַג הַסֻּכּוֹת	7
vac[at]	8
[החמשי]ת [מועד]יה	9
ב[ב] [באמ]ר הַפֶּסַח	10
ב[ב] [בפצץ] הַנֶּף הַעֲמַר	11
ב[ב] [ביחזקאל] הַפֶּסַח הַשְּׁנִי	12
ב/ [בייר]ב חַג הַשְּׁבֻעִים	13
ב[ב] [באמ]ר יוֹם הַזִּכְרוֹן	14

NOTES ON READINGS

L. 4 ב[בי]כֹּיִן. The restoration, בפצץ, in the *PE* is adopted by Snyder who points out that the *PE* reading reflects a scribal error and wonders whether it is an error from memory.²² However, the error is not a scribal mistake but a misreading of the remnant traces of the word. What is read as “the tails of the double *tsadeh* of פצץ in medial and final form”²³ is more likely to be parts of a final ן and a כ. Most of the top part of the word is lost, and what can be seen are part of a bottom horizontal stroke of a letter and the extended down stroke of another. The ן and כ of the expected word

²² Snyder, “Mishmarot Calendars”, 116.

²³ Snyder, “Mishmarot Calendars”, 112.

ביכין fit well with these traces. No trace of the י between these two letters is left, but if the letter was extant it would be found sitting on top of the extant base stroke of the כ similar to the case in 1 iii 12.

TRANSLATION

1. [on the 3 of Jaki]m, the Passover;
2. on the 1 [of Jush]ebeab, the Waving of Omer;
3. on the [5 of I]mmer, the Second Passover;
4. [on the 1 of Ja]ch[i]n, the [Feast] of Weeks;
5. [on the] 4 of Jakim, the Day of Remembrance;
6. [on the] 6 of Huppah, the Day of Atonement;
7. [on the 4] of Jushebeab, the Feast of Booths.
8. [*va*]cat
9. [The fifth] (year), its festivals:
10. on the 3 of Immer, the Passover;
11. on the 1 of Happizzez, the Waving of Omer;
12. [on the] 5 of Jehezkel, the Second Passover;
13. [on the 1 of Jehoiari]b, the Feast of [Weeks;]
14. [on the 4 of Immer, the Day of Remembrance;]

Frg. 4 vi

ב//// בחזיר יום הכפורים	1
ב//// בפצץ חג הסכנ'ת	2
<i>vacat</i>	3
השית מועדיה	4
ב//// ביחזקאל הפס[ה]	5
ב' בגמול הנף העמר	6
[ב////] במעזיה הפסח ה[שני]	7
ב' במלכיה חג ה[שבועים]	8
[ב////] ביחזקאל יום הזכרון	9

[ב//] בִּי כִּי־ [יום הכפורים]	10
[ב//] בגמול חג הסכות	11

TRANSLATION

1. on the 6 of Hezir, the Day of Atonement;
2. on the 4 of Happizzez, the Feast of Booths.
3. *vacat*
4. The sixth (year), its festivals:
5. on the 3 of Jehezekel, the Passov[er;]
6. on the 1 of Gamul, the Waving of Omer;
7. [on the 5] of Maaziah, the [Second] Passover;
8. on the 1 of , the Feast of [Weeks;]
9. [on the] 4 of Jehezke[l, the Day of Remembrance;]
10. [on the] 6 of Jachin, [the Day of Atonement;]
11. [on the 4 of Gamul, the Feast of Booths.]

Frg. 5

חֲדָשִׁים]	1
אתות 33]	2

NOTES ON READINGS

L. 2]33 אתות. Two ciphers of “20” are preserved for this number. Whether there is any other cipher following them is not known, but the two surviving symbols together already make the number at least 40 instead of 33 as stated in the *PE*.

TRANSLATION

1. months [
2. signs 40[+?

Frg. 6

33•[ימ[ים]	2
עֶת אלפים ושש מאות]	3
33•פּוּ שִׁמְנִי]	4

NOTES ON READINGS

L. 2 33•[. The three ciphers total 50. The meaning of the symbol before them is not known, but the editors of the *PE* read the whole number as 170.

TRANSLATION

2.] 50+? da[y]s [
3.]ʿt thousand and six [hundred
4.]•pw• šmn[

Frg. 7

//־ ם[	1
א[תות	2

TRANSLATION

1.]m 12
2. s]igns

Frg. 8

ם[	1
] vacat [	2
]כָּל יוֹמִים]	3

TRANSLATION

1.]m[

- 2.] *vacat* [
- 3.] all the days [

Frg. 9

]	הַרִישוֹן	[	1
]••[		]ל[	2

TRANSLATION

- 1.] the first [
- 2.]ל[]••[

4Q321. 4QCalendrical Doc B^a (Mishmarot B^a)

(PLATES IX-XI)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 68-73; M. Albani, "Die lunaren Zyklen im 364-Tage-Festkalender von 4QMischmerot/4Q S^c," *Forschungsstelle Judentum. Mitteilungen und Beiträge* 4 (1992) 3-47; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 109-116; C. Martone, "Un Calendario Proveniente da Qumran Recentemente Publicato," *Henoch* 16 (1994) 49-75; M. O. Wise, *Thunder in Gemini: And Other Essays on the History, Language and Literature of Second Temple Palestine* (Journal for the Study of the Pseudepigrapha Supplement Series 15; Sheffield: Sheffield Academic Press, 1994) 222-232; M. O. Wise, "Second Thoughts on 4Q321 and the Qumran Synchronistic Calendars," in J. C. Reeves and J. Kampen (ed.), *Pursuing the Text: Studies in Honor of Ben Zion Wacholder on the Occasion of his Seventieth Birthday* (JSOT Supplement Series 184; Sheffield: Sheffield Academic Press, 1994) 98-120; S. Talmon and I. Knohl, "A Calendrical Scroll from a Qumran Cave: Mišmarot B^a, 4Q321," in D. P. Wright, D. N. Freedman, and A. Hurvitz (ed.), *Pomegranates and Golden Bells: Studies in Biblical, Jewish, and Near Eastern Ritual, Law, and Literature in Honor of Jacob Milgrom* (Winona Lake, Indiana: Eisenbrauns, 1995) 267-301; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 311-313; F. García Martínez, "Calendarios en Qumran," *Estudios Bíblicos* 54 (1996) 529-538; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 129-147; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 682-691.

Fragments

A substantial text has been preserved with this manuscript when compared to other calendrical scrolls. Due to the amount of text found and its structural content, nearly all the fragments retrieved can be placed in their relative positions to each other. All identifiable pieces are grouped into two fragments. Fragment 1 contains three columns, and each of them should have eight lines. Both columns 1 and 2 have all the eight lines seen together with parts of the top and bottom margins. Column 3 has only the lower six lines preserved with the bottom margin. The total number of recognisable characters in this fragment is approximately six hundred and fifty. Fragment 2 contains four columns. For the first three columns each one should have nine lines, and the last column should have six. For the first three columns traces of

almost all the lines can be found, but for the last column only part of two lines can be seen. Underneath the lowest preserved line of the last column is a wide bottom margin which occupied about one third of the height of the leather page. This probably indicates that the whole text ends at about line 6 of this column. The total number of characters found in fragment 2 is approximately eight hundred and twenty.

Palaeography

Talmon and Knohl based on the criteria proposed by Cross classify the handwriting of this manuscript as a “late Hasmonean or early Herodian book hand” of the period ca. 50-25 BCE.²⁴

Line Correspondence Chart

Proposed/ <i>Preliminary Edition</i>			Talmon and Knohl		
Frg.	Col.	Lines	Frg.	Col.	Lines
1	i	1-8		i	1-8
1	ii	1-8		ii	1-8
1	iii	1-8		iii	1-8
2	i	1-9		iv	1-9
2	ii	1-9		v	1-9
2	iii	1-9		vi	1-9
2	iv	1-6		vii	1-6

Mus. Inv. 365, 372
PAM 40.610, 40.966, 41.697, 41.698, 42.327, 42.328, 43.328, 43.329

Frg. 1 i

top margin

[ודוקה באחד בידעיה בשני] ם עשר בוא בשנים באבי[ה בחמשה] ועש[רים בשמיני]
[ודוקה]

1

²⁴ Talmon and Knohl, “Mišmarot B^a, 4Q321,” 272.

2	[בשלושה במימין בשנים עשר] בֹּא בשלושה ביקים באר[בעה ועשרים בתשיעי ודוקה בארבעה]
3	[בשכניה בעשתי ע]שֶׁר בוא בחמשה באמר בשלושה וע[ש]רִים בעשֶׁלִירי ודוקה בששה בי[שבאב]
4	[בעשרה בו]א ב[ש]שה ביחזקאל בשנים ועשרים בעשתי עשר החודש ו[דוקה שבת ב]פֶּתַחַה
5	[בתשעה בוא] באחד ביויריב בשנִים ועשרים בשנים עשר החודש ו[דוקה בשנים]ם בדליה
6	[בתשעה בוא vacat ה]שנִית[ית] הראשון בשנִים במלאכיה ב[ע]שֶׁרים בוא ו[דוקה]
7	[בשלושה בחרים בש]בֶּעָה בוא בארב[ע]ה בישוע [ב]עֶשְׂרִים בשני ו[דוקה בחמשה ב]קֹץ בשבעה
8	[בוא בחמשה בחופה בתשעה] עשר בשלישי ודוק[ה] בששה [בא]ל[ישיב] בשֶׁה [בוא שב]ת בַּפִּצִּץ

bottom margin

NOTES ON READINGS

L. 4 ב.פֶּתַחַה. Could this be an orthographic variant? All other occurrences of the priestly name in the extant fragments of the calendrical documents are spelled as פתחיה.

TRANSLATION

1. [and *duqah* on the first of Jedaiah on the twelfth] of it. On the second of Abij[ah on the] twen[ty-fifth of the eighth (month), and *duqah*]
2. [on the third of Mijamin on the twelfth] of it. On the third of Jakim on the [twenty] fou[rth of the ninth (month), and *duqah* on the fourth]
3. [of Shecaniah on the eleve]nth of it. On the fifth of Immer on the tw[en]ty-third of the ten[th (month), and *duqah* on the sixth of Ju]shebeab
4. [on the tenth of] it. On the [si]xth of Jehezkel on the twenty-second of the eleventh month, and [*duqah* (on the) sabbath of] Pethahiah
5. [on the ninth of it.] On the first of Jehoiarib on the twenty-second of the twelfth month, and [*duqah* on the secon]d of Delaiah

6. [on the ninth of it. [The] sec[ond] (year): The first (month) on the sec[on]d of Malchijah on the twen[ty of it, and] *duqah*
7. [on the third of Hezir on the se]venth of it. On the fou[r]th of Jeshua [on the] twenty of the second (month), and [*duqah* on the fifth of] Hakkoz on the seventh
8. [of it. On the fifth of Huppah on the nine]teenth of the third (month), and *duq[ah]* on the sixth [of E]li[ashib] on the sixth [of it. (On the) sabba]th of Happizzesz

COMMENTS

L. 6 בְּ[עֲשָׂרִים בּוֹא וְ]דּוֹקָה 6. The *PE* restores in the lacuna a longer word בְּרֵאשִׁי. As Talmon and Knohl²⁵ point out in their textual note the space of the lacuna here is not enough to accommodate the longer form בְּרֵאשִׁי as proposed in the *PE*, so בּוֹא is more likely to be the appropriate word to fit in the lacuna. In fact this restoration does not only seem appropriate but is actually required by the change in the form of the entry. Being the first entry of a year, it not only has an extra word הַשְּׁנִיָּה introducing the order of the year but also an additional word הַרְאשִׁי at its beginning. The interpretation of this additional word has direct effect on the restoration of the words that follow. The only possible interpretation of the word הַרְאשִׁי is that it refers to the order of the month, which fits well with both its form and location. Therefore with the month order already introduced at the beginning of the entry what is needed in the latter part when the month is referred to is no more than a pronominal suffix attached to the preposition, בּוֹא.

Frg. 1 ii

- | | |
|---|---|
| <p>בְּשִׁמוֹנָה עֶשֶׂר בְּרִבְעֵי וְדּוֹקָה בְּאַחַד בְּאַמֵּר בְּחִמְשָׁה] בּוֹא בְּאַחַד בְּ]גִמּוּל בְּשִׁבְעָה עֶשֶׂר
בְּחִמְשִׁי</p> | 1 |
| <p>וְדּוֹקָה בְּשָׁנִים בִּי] חֶזְקָא] בְּאַרְבַּעַה בּוֹא בְּשְׁלוֹשָׁה בִּיד] עִיָּה בְּ]שִׁבְעָה עֶשֶׂר בְּשִׁי
וְדּוֹקָה בְּאַרְבַּעַה]</p> | 2 |

²⁵ Talmon and Knohl, "Mišmarot B^a, 4Q321," 277.

3	במגזיזה בארבעה בוא בארבע[ה במימין בחמשה עשר] בשביעי ודוקה בח[משה בשעורים בשנים]
4	בוא בששה בשכנ'יה בחמשה[עשר בשמיני ודו]קה שבת באביה בשנים בוא [שבת בבלגא]
5	בארבעה עשר בתשיעי ודוקה [באחד בחופה באחד] בתשיעי ו[דוקה שנית בשלושה ב[חזיר בשלושים]
6	ואחד ב[וא ב]שנים בפתחיה בשל[ושה עשר בעשירי] ודוקה בארבע[ה בי]כין בתשעה ועשר[ים בוא]
7	ב[שלושה בדלי]ה בשנים עשר בעש[תי עשר החודש ודו]קה בששה יויר[יב בת]שעה ועשרים ב[וא בחמשה בחרים]
8	בש[ני]ם עשר בשנים עשר החודש ודוק[ה] שבת[ב]מימין בשמונה ועשרים [בו]א השלישית ה[ראשון]

bottom margin

NOTES ON READINGS

L. 3 במגזיזה. The spelling of the priestly name here is highly unusual. The name appears in MT as מעזיהו, but is usually found as מעזיה, מועזיה, or מעוזיה in the Qumran Scrolls. Here the expected ע is replaced by a ז. This unusual spelling of the name is also found in 2 i 8. However, the other appearance of the name in 2 ii 2 is מעזיה.

TRANSLATION

1. [on the eighteenth of the fourth (month), and *duqah* on the first of Immer on the fifth] of it. On the first of [Gamul on the seventeenth of the fifth (month),]
2. [and *duqah* on the second of] Jehez[kel on the fourth of it. On the third of Jed]aiah on the [seventeenth of the sixth (month), and *duqah* on the fourth]
3. of Maaziah on the fourth of it. On the four[th of Mijamin on the fifteenth] of the seventh (month), and *duqah* on the fi[fth of Seorim on the second]
4. of it. On the sixth of Shecaniah on the fif[teenth of the eighth (month), and *duqah* (on the) sabbath of Abijah on the second of it. [(On the) sabbath of Bilgah]

5. on the fourteenth of the ninth (month), and *duqah* [on the first of Huppah on the first] of the ninth (month), and [*duqa*]*h* the second time on the third of [Hezir on the thirty-]
6. first of [it. On the] second of Pethahiah on the thi[rteenth of the tenth (month),] and *duqah* on the four[th of Ja]chin on the twe[nty] ninth [of it.]
7. On the [third of Delai]ah on the twelfth of the ele[venth month, and *du]qah* on the sixth of Jehoiar[ib on the] twenty-[ni]nth of [it. On the fifth of Harim]
8. on the tw[e]lft[h of the twelfth month, and *duq[ah]* (on the) sabbath [of] Mijamin on the twenty-eighth of [it]. The third (year): The [first (month)]

COMMENTS

L. 4 שבת באביה. A scribal error for שבת בישוע. Jeshua is the priestly course following immediately after Abijah. According to Jewish tradition the change over of the priestly course in the Temple took place on a sabbath, and both the retiring and the incoming courses were involved in some part of the day's duty. The practice of the Calendrical Documents is to name the sabbath after the incoming priestly course. On the sabbath of the second of the eighth month of the second year Abijah is the retiring course and Jeshua is the incoming course, so this sabbath should be called שבת בישוע instead of שבת באביה.

L. 5 [באחד בחופה באחד]. In the *PE* only באחד is restored in the lacuna. However, judging from the content and the space of the lacuna the other two words are needed.

L. 8 השלישית ה[ראשון]. Part of the introductory statement for the beginning of a new year is preserved for the second and the fourth year, but they are slightly different from each other. In the second year the order of the year is followed by the order of the month, while in the fourth the year number is followed immediately by the weekday of the priestly service. The introductory style of the second year is adopted here for two reasons. Firstly, the letter following השלישית despite its damage looks more likely to be a ה than a ב. Secondly, the first month of the fourth year is not a standard entry but one with two unnamed events.

- 1 [בששה בקוץ בעשרה בוא ודוקה בשנים בשכניה בשבעה ועשרים בוא באחד
ביקים בעשרה בשני ודוקה בשלושה בישבאב בששה ועשרים]
- 2 [בוא בשנים באמר בתשעה בשלישי ודוקה בחמשה בפצץ בששה ועשרים בוא
בארבעה ביחזקאל בשמונה ברביעי ודוקה בששה בגמול]
- 3 [בארבעה ועשרים בוא בחמשה במעוזה בשבעה בחמישי ודוקה באחד בחור'ים
בארבעה ועשרים] ב'ו'א שבת במלא[כיה]
- 4 [בשבעה בששי ודוקה בשנים בקוץ בשלושה ועשרים בוא באחד בישוע בחמשה]
בשביעי ודוקה בארבעה באלשיב' בשנים ועש[רים]
- 5 [בוא בשלושה בחופה בחמשה בשמיני ודוקה בחמשה בבלגה באחד ועשרים ב'ו'א
ב'ארבעה בחזיר בארבעה בתשיעי ודוקה שבת י[חזקאל]
- 6 [באחד ועשרים בוא בששה ביכין בשלושה בעשירי ודוקה באחד במעוזה בתשע] ה'
עשר בוא שבת בידעיה בשנים בעשתי ע'ש'ר החודש ודוקה
- 7 [בשלושה בשעורים בתשעה עשר בוא בשנים במימין בשנים עשר החודש ודו]קה
בארבעה באביה בשמונה עשר בוא vacat הרביעית בארבעה בשכנ[יה]
- 8 [באחד בראשון ושנית בחמשה בישבאב בשלושים בוא ודוקה בששה ביקים בשבעה
עשר] ב'ראשון שבת [ב]פתחיה בשלושים בשני ודוקה באחד בחז'יר]

bottom margin

TRANSLATION

1. [on the sixth of Hakkoz on the tenth of it, and *duqah* on the second of Shecaniah on the twenty-seventh of it. On the first of Jakim on the tenth of the second (month), and *duqah* on the third of Jushebeab on the twenty-sixth]
2. [of it. On the second of Immer on the ninth of the third (month), and *duqah* on the fifth of Happizzez on the twenty-sixth of it. On the fourth of Jehezkel on the eighth of the fourth (month), and *duqah* on the sixth of Gamul]
3. [on the twenty-fourth of it. On the fifth of Maaziah on the seventh of the fifth (month), and *duqah* on the first of Har[im on the twen]ty-[fourth] of it. (On the) sabbath of Mal[chijah]

4. [on the seventh of the sixth (month), and *duqah* on the second of Hakkoz on the twenty-third of it. On the first of Jeshua on the fifth] of the seventh (month), and *duqah* on the fourth of Eliashib on the twe[nty]second
5. [of it. On the third of Huppah on the fifth of the eighth (month), and *duqah* on the fifth of Bilgah on the twenty-first of] it. On the fourth of Hezir on the fourth of the ninth (month), and *duqah* (on the) sabbath of Je[hezkel]
6. [on the twenty-first of it. On the sixth of Jachin on the third of the tenth (month), and *duqah* on the first of Maaziah on the nine]teenth of it. (On the) sabbath of Jedaiah on the second of the eleventh month, and *duqah*
7. [on the third of Seorim on the nineteenth of it. On the second of Mijamin on the second of the twelfth month, and *duqah* on the fourth of Abijah on the eighteenth of it. *vacat* The fourth (year): On the fourth of Shecan[iah]
8. [on the first of the first (month), and the second time on the fifth of Jushebeab on the thirtieth of it, and *duqah* on the sixth of Jakim on the seventeenth of the] first (month). (On the) sabbath [of] Pethahiah on the thirtieth of the second (month), and *duqah* on the first of Hez[ir]

COMMENTS

L. 7-8. The entry for the first month of the fourth year is different from the others because in this month the unnamed event happens twice, first on day 1 of the month and then a second time on day 30. This peculiarity contributes to the difficulty in restoring the missing words in this entry. Since there is no parallel to the other entries, the restoration of this line differs in almost every available transcription.

הרביעית בארבעה בשכניה באחד בראשון ודוקה בששה ביקים בשבעה עשר בראשון	Eisenman & Wise
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הרביעית בארבעה בשכניה באחד בראשון ודוקה בששה ביקים בשבעה עשר בוא בשלושים בראשון	PE
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הרביעית בארבעה בשכניה באחד בראשון ודוקה בששה ביקים בשבעה עשר השנית בחמשה בישבאב בשלושים בראשון	Snyder
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הרביעית בארבעה בשכניה באחד בראשון השנית בחמשה בישבאב בשלושים בוא ודוקה בששה ביקים בשבעה עשר בראשון	Talmon & Knohl
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Eisenman and Wise²⁶ ignore the second occurrence of the unnamed event. As a result their restoration produces the most apparently smooth reading, for it appears with exactly the same format as the other entries. However, by omitting one of the events it renders the interpretation of the system of the text in enumerating the events almost impossible.

The *PE* does deal with the peculiarity but only partially.²⁷ It first restores the line according to the standard format of the entries and then adds on the day and the month of the second unnamed event at the end of the entry. The two extra words seem awkward and out of place with the rest of the line. Firstly, in marking the event in such a way they differ from the rest of the text by having only the day and month but not the weekday and the priestly course. Secondly, without any other words attached to them it is difficult to see how a reader can make sense of them and know what they are referring to.

Snyder²⁸ adopts the arrangement of the *PE* but modifies it by putting back in the priestly course and the weekday, and adding an introductory word השנייה to the event. These modifications render a restoration with all the necessary elements needed to produce a reasonable description of the event. However, adding on the second unnamed event to the end of the entry is the weakness of Snyder's proposal. With no name given to this event the word השנייה provided by Snyder to introduce the event has no specific denotation that it is referring to the unnamed event. Placing the event after the description of a דוקה could easily lead to the misinterpretation of the word השנייה as referring to the דוקה - the second (*duqah*).

Taking all these considerations into account, the restoration proposed by Talmon and Knohl²⁹ is the most acceptable one. Although the proposal still has to be regarded as conjectural, in terms of providing necessary information and a sensible reading it is

²⁶ Eisenman and Wise, *The Dead Sea Scrolls Uncovered*, 111.

²⁷ Wacholder and Abegg, *Preliminary Edition*, 70.

²⁸ Snyder, "Mishmarot Calendars", 138.

²⁹ Talmon and Knohl, "Mišmarot B^a, 4Q321," 278.

more reasonable than the others. Hence it is adopted in this study with only a minor modification from השנית to ושנית.

Frg. 2 i

- 1 [בשבעה בחמישי וד]וקה באחד ב[בלג]א באר[בעה ועשרי]ם בֹּאָ שבת בחזיר בשבע[ה]
- 2 [בששי ודוקה בשנים בפתחיה] בשלושה ועשרים בוא באחד ביכין בחמשה בשביעי
ודוקה בארבעה
- 3 [בדליה בשנים ועשרים] בוא בשלושה ביורב בחמשה בשמיני ודוקה בחמשה בחרים
- 4 [באחד ועשרים בוא באר]בעה במלאכיה בארבעה בתשיעי ודוקה שבת באביה באחד
- 5 [ועשרים בוא בששה בי]שׁוּעַ [ב]שלושה בעשירי ודוקה באחד ב[י]קים בתשעה עשר
ב[וא]
- 6 [שבת בישבאב בשנים בעשתי ע]שר הַחֹדֶשׁ ודוקה בשל[ושה באמר] בְּתִשְׁעָה עֶשֶׂר בוא
- 7 [בשנים בפצין בשנים בשנים] עשר החודש ודוקה בארב[עה ביחזק]אל בשמונה עשר
- 8 [בוא vacat השנה הרא]שונה החוד[ש הראש]וֹן בְּגִמּוּל בשלו[שה במג]וֹזִיָּה בֹּאָ
[הפסח]
- 9 [בידעיה בוא הנף העומר השני בידעיה ב]שעורים [בוא הפסח השני השלישי בקוץ]

bottom margin

NOTES ON READINGS

L. 8 [במג]וֹזִיָּה. The letter following the מ, although it can only be partially seen, is more likely to be a ל than either an ע or a י. This agrees with the reading of the priestly name in 1 ii 3.

TRANSLATION

1. [on the seventh of the fifth (month), and *d]uqah* on the first of [Bilga]h on the [twenty-four]th [of it.] (On the) sabbath of Hezir on the seven[th]

2. [of the sixth (month), and *duqah* on the second of Pethahiah] on the twenty-third of it. On the first of Jachin on the fifth of the seventh (month), and *duqah* on the fourth
3. [of Delaiah on the twenty-second] of it. On the third of Jehoiarib on the fifth of the eighth (month), and *duqah* on the fifth of Harim
4. [on the twenty-first of it. On the fourth of Malchijah on the fourth of the ninth (month), and *duqah* (on the) sabbath of Abijah on the twenty
5. [first of it. On the sixth of Je]shua [on the] third of the tenth (month), and *duqah* on the first of Jakim on the nineteenth of [it.]
6. [(On the) sabbath of Jushebeab on the second of the eleventh month, and *duqah* on the third of Immer] on the nineteenth of it.
7. [On the second of Happizzes on the second of the twelfth month, and *duqah* on the fourth of Jehezkiel on the eighteenth
8. [of it. *vacat* The first [year: The first month] is in [Gamul; on the third of Ma]aziah] of it is [the Passover;]
9. [in Jedaiah of it is the Waving of Omer. The second (month) is in Jedaiah; in] Seorim [of it is the Second Passover. The third (month) is in Hakkoz;]

COMMENTS

L. 8 בַּגְּמוּל בְּשִׁלּוֹ שָׁה. The restoration of Talmon and Knohl³⁰ is adopted. Although it does not comply with the other entries of the festivals in this text in mentioning the weekday of the festival, it is a better reconstruction for the following considerations. First, the second word ends with a ה, therefore it cannot be בגְּמוּל as expected if this entry agrees with the others. The restoration in the *PE*, בַּדְּלִיָּה, agrees with the reading of this letter but it also points to a scribal error. However, this inferred scribal mistake is extremely unlikely. The entry is concerned with the priestly course on duty at the beginning of the first year. Reckoning Gamul at the beginning of the sexennial cycle is no ordinary entry but one of the fundamental concepts of the Qumran calendar which has been emphasised repeatedly in the Calendrical

³⁰ Talmon and Knohl, "Mišmarot B", 4Q321," 279.

Documents. Unless the complete word is found in the manuscript, it is unfair to restore the text based on a serious scribal mistake. Second, the space in the lacuna is certain to be wider than having just only two letters.

Frg. 2 ii

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- | | |
|---|--|
| 1 | בישׁוע בוא חג השבוע[ים הר]ב[יעי באלי]שיב החמישי ב[בלגא הששי ביח]זק[א] ל
השביעי[עי] |
| 2 | במועזיה הואה יום הזכרון בי>ו<יריב בוא יום הכפורים בידעיה בוא[חג ה]סוכות
השמיני [בשעורים] |
| 3 | התשיעי בישוע העשירי <ב>בחופה עשתי עשר החודש בחזיר שנים עשר החודש
בגמול[vacat] |
| 4 | השנית הראשון בידעי[ה] בשעורים בוא הפסח ב[מ]ימי[ן] [ב]וא הנף העומר ה>ש<ני
במ[ימין באביה] |
| 5 | בוא הפסח השני ה[שלישי בא]ל[ישיב] ובח[ן]פה [בוא חג השבועים ה[ר]ביעי [בב]לגא
החמישי בפתחיה |
| 6 | [הששי במעזיה השביעי בשעורים הואה יו]ם הזכרון במלאכיה[בוא יום הכ]פורים
במימין |
| 7 | [בוא חג ה]סוכות[ן] השמיני באביה התשיעי ב[חופה העשירי בחזיר ע]שתי עשר [
החודש ביכין |
| 8 | [שני]ם עשר הח[וד]ש[ן] בידעיה vacat ה[שלישית הראשון ב]מימי[ן] באביה
בוא |
| 9 | הפסח בשכנ[ן]י[ה] בוא הנף העומר הש[ני] בשכניה ביקים בוא הפסח ה[שני השלישי
בבלגא בחזיר |

bottom margin

TRANSLATION

1. in Jeshua of it is the Feast of Week[s. The f]ou[rth (month) is in E]liashib. The fifth (month) is in [Bilgah. The sixth (month) is in Jehe]zk[e]l. The seven[th (month) is]

2. in Maaziah, that is the Day of Remembrance; in Jehoiarib of it is the Day of Atonement; in Jedaiah of it is [the Feast] of Booths. The eighth (month) is [in Seorim.]
3. The ninth (month) is in Jeshua. The tenth (month) is in Huppah. The eleventh month is in Hezir. The twelfth month is in Gamul.[*vacat*]
4. The second (year): The first (month) is in Jedaia[h]; in Seorim of it is the Passover; in Mijamin [of] it is the Waving of Omer. The second (month) is in M[i]jamin; in Abijah]
5. of it is the Second Passover. The [third (month) is in E]l[iashib]; and in Hu[ppah] of it is the Feast of Weeks. [The] fourth (month) is [in Bi]lgah. The fifth (month) is in Pethahiah.
6. [The sixth (month) is in Maaziah. The seventh (month) is in Seorim, that is the Da]y of Remembrance; in Malchijah [of it is the Day of] Atonement; in Mijamin
7. [of it is the Feast of] Booths. [The eighth (month) is in Abijah. The ninth (month) is in] Huppah. The tenth (month) is in Hezir. The e[leventh] month is in Jachin.
8. [The tw]elfth mo[nt]h is [in Jedaiah. *vacat*] The third (year): The first (month) is in Mijamin; in Abijah of it is
9. the Passover; in Shecan[ia]h of it is the Waving of Omer. The sec[ond] (month) is in Shecaniah; in Jakim of it is [the] Second Passover. The third (month) is in Bilgah; in [Hez]ir

COMMENTS

L. 1-2 השביעי [ע]י] במועדיה הואה יום הזכרון. Here, as well as in the other years with the exception of year three, the editors of the *PE* reconstruct the priestly name twice, once for the beginning of the seventh month and the other for the Day of Remembrance. The festival falls on exactly the same day as the first day of the month. If the standard formulas are applied to the dual functions of this day separately the result will be as the restoration of the *PE*. However, the extant texts prove that this is not the case. The description integrates the two events into a single entry by

appending the festival to the standard formula of the month with the pronoun הַזֶּה. The pronoun found in the extant entries of this festival forms an important clue to its difference from the standard formula. For the other festivals the priestly course is connected to the festival name by a resumptive pronoun בּוֹא, which refers back to the month order. If the standard formula also applies to the Day of Remembrance, as suggested in the *PE*, the text has no need to break away from the general pattern by introducing a new word into the formula. The more definite evidence for the change of the description formula is found in 2 iii 8-9. Although the entry falls at the turn of the lines, it is still possible to see that the priestly name is only mentioned once.

Frg. 2 iii

- 1 [בוא חג] הַשְּׁבוּעָה [הַרְבִּיעִי] בְּ[פִתְחִיָּה הַחֲמִישִׁי בְּדִלְיָה הַשְּׁשִׁי בִשְׁ[עוּרִים] הַשְּׁבִיעִי
בִּאֲבִיָּה] <[הוֹאֵה יוֹם] הַזְּכוּרֹן בִּישׁוּעַ> בּוֹא יוֹם הַכְּפוּרִים
- 2 [בשכניה] בּוֹא חג הַ[סִּכּוֹת הַשְּׁמִינִי בִיקִים הַתְּשִׁיעִי בַחֲזִיר הַעֲשִׂירִי] בִּיכֵן עֲשֵׂתִי עֶשֶׂר
הַחֹדֶשׁ בְּיֹרִיב [שָׁנִים]
- 3 עֲשֵׂר [הַחֹדֶשׁ בְּ]מִי[מִין] *vacat* הַרְבִּיעִית הָרִאשׁוֹן בְּשִׁכְנִיָּה בִיקִים בּוֹא הַפֶּסַח
בִּישְׁבָּאב בּוֹא הַנֶּף הָעוֹמֵר הַשְּׁנִי
- 4 בִישְׁבָּאב בְּאֶמֶר בּוֹא הַפֶּסַח הַשְּׁנִי הַשְּׁלִישִׁי בְּפִתְחִיָּה בִיכֵן בּוֹא חג [הַשְּׁבוּעִים
הַרְבִּיעִי בְּדִלְיָה הַחֲמִישִׁי]
- 5 [בַּחֲרִי]ם הַשְּׁשִׁי בְּ[אֲבִיָּה הַשְּׁבִיעִי בְּיֹקִים] הוֹאֵה יוֹם [הַזְּכוּרֹן] בְּחֹפֶה] בּוֹא יוֹם
הַכְּפוּרִים בִּישְׁבָּאב בּוֹא חג
- 6 [הַסִּכּוֹת] הַשְּׁמִינִי בְּאֶמֶר הַתְּשִׁיעִי בְּ[יכֵן הַעֲשִׂירִי בִיֹּרִיב] בְּעֲשֵׂתִי עֶשֶׂר <[חֹדֶשׁ]>
בְּמִלְאִכָּה שָׁנִים עֶשֶׂר הַחֹדֶשׁ בְּשִׁכְנִיָּה]
- 7 [*vacat*] הַחֲמִישִׁית הָרִאשׁוֹן בְּ[ישְׁבָּאב בְּאֶמֶר] בּוֹא הַפֶּסַח בְּ[צִץ בּוֹ] אֶל הַנֶּף הָעוֹמֵר
הַשְּׁנִי בְּפֶצֶץ בְּיֹחֲזָקָא בּוֹא
- 8 הַפֶּסַח [הַשְּׁנִי הַשְּׁלִישִׁי בְּ]דִלְיָה בִיֹּרִיב בּוֹא חג [הַשְּׁבִיעִי] בְּ[עִי] בַּחֲרִים הַחֲמִישִׁי
בְּקִי[וֹן] [הַשְּׁשִׁי בִיקִים הַשְּׁבִיעִי]
- 9 בְּאֶמֶר הוֹאֵה יוֹם הַזְּכוּרֹן בַּחֲזִיר בּוֹא יוֹם הַכְּפוּרִים בְּ[צִץ בּוֹא <ח> הַסִּכּוֹת הַשְּׁמִינִי
בְּ[יֹחֲזָקָא הַתְּשִׁיעִי בִיֹּרִיב] וְהַעֲשִׂירִי

bottom margin

TRANSLATION

1. [of it is the Feast of] Week[s. The four]th (month) is in [Pethahiah. The fifth (month) is in Delaiah. The sixth (month) is in Se]ori[m. The seventh (month) is in Abijah,] <[that is the D]ay of [Remembrance; in Jeshua]> of it is the D[ay of Atonement;]
2. [in Shecani]ah of it is the Feast of B[o]oths. The ei[gh]th (month) is in Jakim. The ninth (month) is in Hezir. The tenth (month) is] in Jachin. The eleve[n]th month is] in Jehoiarib. [The]
3. [twelf]th month is in [Mij]amin.[*vacat* The fourth (year): The first (month) is in Shecaniah; in Jakim of it is the Passover; in Jushebeab of it is the Waving of Omer. The second (month) is]
4. in Jushebeab; in I[m]mer of it is the Second Passover. The t]hir[d (month) is in Pethahiah; in Jachin of it is the Fea]st of [Weeks. The fourth (month) is in Delaiah. The fifth (month) is]
5. in Har[i]m. The sixth (month) is in [Abijah. The seve]nth (month) is in Jaki[m, that is the Da]y of [Remembrance;] in Huppah [of it is the Day of Atonement; in Jushebeab of it is the Feast of]
6. [Boot]hs. The eighth (month) is in Immer. The ninth (month) is in [Jachin. The tenth (month) is in Jehoiari]b. The ele[venth] <mon[th]> is in Ma[lchijah. The twelfth month is in Shecaniah.]
7. [*vacat*]The fifth (year): The f[ir]st] (month) is in [Jushebeab; in Immer] of it is the Passover; in Happ[i]zzez of] it is the Waving of Omer. The sec[ond] (month) is in Happizz]ez; in Jehezkel of it is
8. [the] Second Passover. The third (month) is in [Delaiah; in Jehoiarib of it is the Feast of W]eeks. The f[our]th] (month) is in Harim. The fifth (month) is in Hakk[o]z. [The si]xth (month) is in Jakim. The seventh (month) is
9. in Immer, that is the Day of Remem[brance; in Hezir of it is the Day of Atonement; in Happ]izzez of it is the <Fe>ast of Booths. The eighth (month) is in [Je]hezkel. The ninth (month) is in Jehoiar[ib]. The tenth (month) is

- 1 [במלאכיה עשתי עשר החודש בישוע שנים עשר החודש בישבאב] *vacat*
- 2 [השנית הראשון בפצין ביחזקאל בוא הפסח בגמול בוא הנף העומר השני בגמול
במעזיה בוא]
- 3 [הפסח השני השלישי בחרים במלאכיה בוא חג השבועים הרביעי בקון החמישי
באלישיב השני]
- 4 [באמר השביעי ביחזקאל הואה יום הזכרון ביכין בוא יום הכפורים בגמול בוא]חג
- 5 [הסוכות השמיני במעזיה התשיעי במלאכיה העשירי בישוע] עשתי עשר [ה]חודש
בחופה
- 6 [שנים עשר החודש בפצין]

bottom margin

NOTES ON READINGS

A wide bottom margin, which occupies almost one third of the page, sits below the extant lines of this column indicating the end of the manuscript.

TRANSLATION

1. [in Malchijah. The eleventh month is in Jeshua. The twelfth month is in Jushebeab.]
2. [The sixth (year): The first (month) is in Happizzez; in Jehezkel of it is the Passover; in Gamul of it is the Waving of Omer. The second (month) is in Gamul; in Maaziah of it is]
3. [the Second Passover. The third (month) is in Harim; in Malchijah of it is the Feast of Weeks. The fourth (month) is in Hakkoz. The fifth (month) is in Eliashib. The sixth (month) is]
4. [in Immer. The seventh (month) is in Jehezkel, that is the Day of Remembrance; in Jachin of it is the Day of Atonement; in Gamul of] it is the Feast of

5. [Booths. The eighth (month) is in Maaziah. The ninth (month) is in Malchijah. The tenth (month) is in Jeshua.] The elevent[h m]onth is in Huppah.
6. [The twelfth month is in Happizzesz.]

4Q321a. 4QCalendrical Doc B^b (Mishmarot B^b)

(PLATES XII)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 74-76; M. O. Wise, *Thunder in Gemini: And Other Essays on the History, Language and Literature of Second Temple Palestine* (Journal for the Study of the Pseudepigrapha Supplement Series 15; Sheffield: Sheffield Academic Press, 1994) 222-232; M. O. Wise, "Second Thoughts on 4Q321 and the Qumran Synchronistic Calendars," in J. C. Reeves and J. Kampen (ed.), *Pursuing the Text: Studies in Honor of Ben Zion Wacholder on the Occasion of his Seventieth Birthday* (JSOT Supplement Series 184; Sheffield: Sheffield Academic Press, 1994) 98-120; S. Talmon and I. Knohl, "A Calendrical Scroll from Qumran Cave 4: Mishmarot B^b (4Q321^a)," in M. V. Fox, et al. (ed.), *Texts, Temples, and Traditions* (Winona Lake, Indiana: Eisenbrauns, 1996) 65*-71* [Hebrew], with English abstract on 409; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 311-312; F. García Martínez, "Calendarios en Qumran," *Estudios Bíblicos* 54 (1996) 539-540; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 147-153; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 690-693.

Fragments

This manuscript has three large fragments and two very small ones. However, only one of them contains substantial text. This largest fragment, fragment 3, shows about ten lines and part of the right margin. On the margin the stitching marks for joining two pages of leather together can be seen. The number of characters on this fragment is one hundred and seventy. Fragment 1 shows two columns, but the first column has only a few words in three lines. The second column shows eight lines, but each line also has only one or two words. There are altogether approximately seventy-five characters in this fragment. Fragment 2 consists of three separated pieces, a very small piece with only eleven characters, another small one with approximately ten characters, and a larger one with seven lines and forty-one characters. The other two fragments, fragment 4 and 5, are very small with only one or two recognisable words.

The writing style of this manuscript is very close in form to the one of 4Q321. Thus 4Q321a is also likely to be from the period ca. 50-25 BCE out of a late Hasmonean or early Herodian book hand.

Line Correspondence Chart

Proposed			Preliminary Edition			Talmon and Knohl		
Frg.	Col.	Lines	Frg.	Col.	Lines	Frg.	Col.	Lines
1	i	4-9	1	i	5-10		i	3-8
	n/a		1	ii	1		i	13
1	ii	1-8	1	ii	2-9		ii	1-8
2		1-8	2		1-8		iv	2-9
3		1-10	3		1-10		vii	1-10
4		1-2	4		1-2		vi	8-9
5		1-3	5		1-3		vi	6-8

Mus. Inv. 190
PAM 40.617, 41.701, 42.331, 43.332

Frg. 1 i

[שבת בקוץ בשלושים בשיני וחוקה באחד במלאכיה בשבעה ע]שׁר בּוֹא	4
[באחד באלישיב בתשעה ועשרים בשלישי ודוקה] בְּשָׁנִים בישוע ב[ששה]	5
[עשר בוא vacat בשלושה בבלגא בשמ]ונה ועשרים בְּרִבְעִי	6
vacat [ודוקה בארבעה בחופה בחמשה עשר בוא]	7
[בארבעה בפתחיה בשבעה ועשרים בחמישי ודוקה בחמשה בחזי]ר	8
[בארבעה עשר בוא]	9

TRANSLATION

4. [(On the) sabbath of Hakkoz on the thirtieth of the second (month), and *duqah* on the first of Malchijah on the sevent]eenth of it.

5. [On the first of Eliashib on the twenty-ninth of the third (month), and *duqah* on the second of Jeshua on the [sixteenth]
6. [of it. *vacat* On the third of Bilgah on the] twenty-[eig]hth of the fourth (month),
7. [and *duqah* on the fourth of Huppah on the fifteenth of it.] *vacat*
8. [On the fourth of Pethahiah on the twenty-seventh of the fifth (month), and *duqah* on the fifth of Hezi]r
9. [on the fourteenth of it.]

Frg. 1 ii

בארבֿ[עה ועשרים בתשיעי ודוקה בארבעה בשכניה]	1
בא־חד עשר] בוא <i>vacat</i> בחמשה באמר בשלושה ועשרים]	2
בעשירי וְ[דוקה בששה בישבאב בעשר בוא <i>vacat</i>]	3
בששה בִּי־חזקאל בשנים ועשרים באחד עשר החודש ודוקה]	4
שבת בפת־חיה [בתשעה בוא <i>vacat</i> באחד ביו־ריב בשנים]	5
ועשרים בשנים עש[ר החודש ודוקה בשנים בדליה בתשעה]	6
בוא <i>vacat</i>]	7
השנִי־ת הראשון בשנים במלאכיה בעשרים בוא ודוקה]	8

TRANSLATION

1. on the [twenty] fou[rth of the ninth (month), and *duqah* on the fourth of Shecaniah]
2. on the eleventh [of it. *vacat* On the fifth of Immer on the twenty-third]
3. of the tenth (month), and [*duqah* on the sixth of Jushebeab on the tenth of it.]
4. On the sixth of Je[hezkel on the twenty-second of the eleventh (month), and *duqah*]
5. (on the) sabbath of Pethahiah [on the ninth of it. *vacat* On the first of Jehoiarib on the]
6. twenty-[second] of the twelft[h month, and *duqah* on the second of Delaiah on the ninth]

7. of it. *vacat* [
8. The secon[d (year): The first (month) on the second of Malchijah on the twenty of it, and *duqah*]

COMMENTS

L. 8 בוא. The restoration here is based on the parallel section in 4Q321 1 i 6. Similarly, the *PE* restores here with בראשון as in 4Q321. For the discussion on the two different restorations and their respective interpretations of the line see the note on 4Q321 1 i 6.

Frg. 2

[בשנים באמר בתשעה בשלישי ודוקה בחמשה בפצץ בששה ועשרים]	1
בוא <i>vacat</i> בארבעה ביחזקאל בשמונה ברביעי ודוקה בששה ב[גמול]	2
[בארבעה ו]עשרים בוא <i>vacat</i> בחמשה במעוזה בשבעה [בחמישי]	3
[ודו]קיה באחר[ך בחרים בארבעה ועשרים בוא <i>vacat</i> ש]בת במלכיה בשבע[ה]	4
[בששי ודוק]ה בש[נים בקוץ בשלושה ועשרים בו]א <i>vacat</i>	5
[באחד בישוע]ה [בחמש]ה בשביעי ודוקה בארבעה בא[ל]ישי[ב בשנים ועשר]ים]	6
בוא <i>vacat</i> בשלו[שה בחופ]ה בחמשה בשמיני ודוקה בחמשה ב[בלגא]	7
[באחד ועשרים בוא]	8

TRANSLATION

1. [On the second of Immer on the ninth of the third (month), and *duqah* on the fifth of Happizzez on the tw]enty-[sixth]
2. [of it. *vacat* On the fourth of Jehezkel on the eighth of the fourth (month), and *duqah* on the sixth of] Gamul
3. [on the twenty] fourth [of it. *vacat* On the fifth of Maaziah on the seventh] of the fifth (month),
4. [and *duqyah* on the firs[t of Harim on the twenty-second of it *vacat* (on the) sa]bbath of Malchijah on the seven[th]

5. [of the sixth (month) and *duqa*]h on the se[cond of Hakkoz on the twenty-third of i]t. *vacat*
6. [On the first of Jeshua]on the fift[h of the seventh (month), and *duqah* on the fourth of E]l[iashi]b on the twen[ty] second
7. [of it. *vacat* On the thi]rd of Hupp[ah on the fifth of the eighth (month), and *duqah* on the fifth of] Bilgah
8. [on the twenty-first of it.]

COMMENTS

L. 4 וּדְוִן[קִיָּה]. The word is found, partially or wholly, four times in the fragments, 2:4, 3:5, 3:8, and 4:1. Its entry in the *PE* is either דְּוִקִי or דְּוִקִיָּה, but it has been changed by Talmon and Knohl¹ to דְּוִקוֹן and דְּוִקוֹה. Wise², in accordance with Talmon and Knohl, also points out that the reading in the *PE* by Wacholder and Abegg is wrong, but provides no further explanation other than his own interpretation that the word should be understood as a noun with a 3ms suffix. ו and ך are indistinguishable in this manuscript, so no definite conclusion can be drawn. The grammatical analysis given by Wise is possible, but not certain.

L.5-7. The three small fragments in the middle of the photograph PAM 43.332 are identified as parts of fragment 2. There is no physical connection between the three, and their related positions can only be confirmed by their content. The editors of the *PE* only include two of these fragments but omit the one in the lower left. This fragment, containing three lines of words, is joined by Talmon and Knohl as part of lines 6-8,³ but the editors of the *SE*, García Martínez and Tigchelaar, placed it together with lines 5-7.

Talmon and Knohl		García Martínez and Tigchelaar	
בש[ביעי	6	וּדְרָק]ה בש[נים	5
בחמשה] בחופה]	7	בישוע]בחמשה]	6
בארב]עה בחזיר]	8	בשלו]שה בחופה]	7

¹ Talmon and Knohl, "Mišmarot B^b (4Q321a)," 66*-69*.

² Wise, "Second Thoughts", 100, n. 4.

³ Talmon and Knohl, "Mišmarot B^b (4Q321a)," 67*.

Both arrangements of the fragment seem possible, but the *SE*'s restoration is adopted here for its better line spacing. In order to make the words appear in their approximate positions as on the fragment, Talmon and Knohl had to put in a gap before בחמש[ה on line 5 but provide no gap after the word בוא in line 7. Although it is true that the spacing of the writing in this manuscript appears to be very uneven, gaps are always found at the end of a complete sentence, that is after the word בוא, instead of in the middle of it. The restoration in the *SE* agrees with this scribal practice.

Frg. 3

[ביקים בארבעה בוא vacat בארבעה בפ] צץ ב[חמשה עשר בשביעי ודוקה]	1
[בחמשה באמר ב[שנים בוא vacat בש]שה בגמול[ל בחמשה עשר בשמיני ודוקה]	2
[שבת ביכי]ן בשנים בוא שבת ב[חרי]ם בארבעה ע[שר בתשיעי ודוקה באחד]	3
[ב[יוי]רי]ב באחד בוא vacat בשלושה במלכיה בש[לושים ואחד בוא דוקה שנית]	4
בשנים בקוץ בשלושה עשר בעשירי ודוקה [בארבעה בישוע בתשעה]	5
ועשרים בוא vacat בשלושה באלישיב ב[שנים עשר באחד עשר החודש ודוקה]	6
בששה בחופהא בתשעה עשר <ועשרים> בוא vacat [בחמשה בבלגה בשנים עשר]	7
בשנ ים עשר החודש ודוקי שבת [בפצץ בשמונה ועשרים בוא vacat]	8
הש[שי]ת ב[ש]שה בפתחיה בעשרים [בראשון ודוקה בשנים בגמול בשבעה ועשרים	9
[בוא vacat] באחד [מעוזה בעשרה בשיני ודוקה בשלושה בידעיה בששה ועשרים בוא]	10

NOTES ON READINGS

L. 7 חופהא. Could this be an orthographic variant or a scribal error? Both חופא and חופה are attested in the Qumran Calendrical Documents but not חופהא.

L. 7 <ועשרים>. A superlinear correction for the erroneous עשר.

L. 7 [בחמשה בארבעה]. בארבעה is wrongly reconstructed in the *PE*, as also in the *SE*.

TRANSLATION

1. [of Jakim on the fourth of it. *vacat* On the fourth of Happi]zzez on the [fifteenth of the seventh (month), and *duqah*]
2. [on the fifth of Immer on the] second of it. [*vacat* On the si]xth of Gamu[l on the fifteenth of the eighth (month), and *duqah*]
3. [(on the) sabbath of Jachi]n on the second of it. (On the) sabbath of [Hari]m on the fourt[eenth of the ninth (month), and *duqah* on the first]
4. [of] Jehoiarib on the first of it, *vacat* on the third of Malchijah on the th[irty-first of it *duqah* the second time.]
5. On the second of Hakkoz on the thirteenth of the tenth (month), and *duqyah* [on the fourth of Jeshua on the twenty]
6. ninth of it. *vacat* On the third of Eliashib on the [twelfth of the eleventh month, and *duqah*]
7. on the sixth of Huppah on the nineteenth (corrected to twenty-ninth) of it. *vacat* [On the fifth of Bilgah on the twelfth]
8. of the twelfth month, and *duqya* (on the) sabbath [of Happizzez on the twenty-eighth of it. *vacat*]
9. The s[ix]th (year): On the s[ix]th of Pethahiah on the twentieth [of the first (month), and *duqah* on the second of Gamul on the twenty-seventh of it.]
10. [*vacat*]On the first of [Maaziah on the tenth of the second (month), and *duqah* on the third of Jedaiah on the twenty-sixth of it.]

COMMENTS

L. 3-4. These lines mark the occurrence of a double *duqah* month. Another similar double *duqah* entry is found in 4Q321 1 ii 5, yet the presentation of the two varies slightly. The section concerning the second *duqah* in 4Q321 starts with the name of the event שניית דוקה which is then followed by the calendrical data. In line 4 of this manuscript the beginning of the second *duqah* section starts immediately with the calendrical data. Based on the parallel entry in 4Q321 the missing half of this section is restored, but since the event name is not found at the beginning of the section it is

restored at the end following the calendrical data, a restoration agreed by all the available studies.

L. 9 בעשרים. This is a scribal error, the number should be בעשר. The mistake here and in line 7 suggests that the scribe was probably confused by the numbers עשר and עשרים for both of these words appear in the same entry at this part of the text.

Frg. 4

אי ודוקי ב]	1
אי <ב>שׂי]	2

TRANSLATION

- 1.]y and *duqya b*[
- 2.]y <*b*>*š*['

COMMENTS

This small fragment is placed by Talmon and Knohl⁴ with lines 8-10 of column 4. Their reading of separating the three letters in line 2 into two different lines is a strange and unlikely suggestion.

Frg. 5

הֶ]	1
בשל[ושה	2
בִּ]	3

TRANSLATION

- 1. *h*['
- 2. on the th[ird

⁴ Talmon and Knohl, “Mišmarot B^b (4Q321a),” 68*.

3. *b*[

COMMENTS

Only the three letters in line 2 are listed in the *PE*, and they are read as “בַּחֲלִי־ן”, a reading obviously different from what is found in the fragment. Talmon and Knohl place this fragment with lines 6-8 of their column 6.

4Q322. 4QCalendrical Doc C^a (Mishmarot C^a)

(PLATES XIII)

Bibliography: J. T. Milik, "Le travail d'édition des manuscrits du désert de Juda," Volume du Congrès Strasbourg 1956 (Supplements to Vetus Testamentum 4; Leiden: Brill, 1957) 25-26; B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 77-78; G. Vermes, "Qumran Forum Miscellanea I," *Journal of Jewish Studies* 43 (1992) 304; M. O. Wise, *Thunder in Gemini: And Other Essays on the History, Language and Literature of Second Temple Palestine* (Journal for the Study of the Pseudepigrapha Supplement Series 15; Sheffield: Sheffield Academic Press, 1994) 186-221; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 119-127; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 314-315; F. García Martínez, "Calendarios en Qumran," *Estudios Bíblicos* 54 (1996) 543-544; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 205-220; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 692-695; B. Z. Wacholder, "Historiography of Qumran: The Sons of Zadok and Their Enemies," in F. H. Cryer and T. L. Thompson (ed.), *Qumran Between the Old and New Testaments* (JSOT Supplement Series 290; Sheffield: Sheffield Academic Press, 1998) 366-367.

Fragments

Four fragments of this manuscript have been preserved. One of them, fragment 4, is very small and only contains a few letters, whereas the other three are larger and contain more information. Fragment 1 has forty-eight recognisable characters, fragment 2 has sixty-three, and fragment 3 has eighteen. The manuscript is written on a very porous leather. As a result the ink has soaked through the leather and can be seen on the reverse side where some of the characters can be clearly read. The photograph 43.336 shows the front of the manuscript, whereas 43.337 reveals the back of the leather.

This manuscript was copied by a semicursive hand. When compared to the samples of scripts listed by Cross, it is closer in style to the one of a “late Hasmonean semicursive script”.⁵ Therefore this manuscript may come from the period ca. 50-25 BCE.

Mus. Inv. 694

PAM 41.702, 42.334, 43.336, 43.337

Frg. 1

א[בעשׁוֹר]	1
•[ידעיה בשׁשה עשׁ]ר בה	2
בעשרים ו[שבעה בחודש]	3
הושיב ג•[	4
גו[אים וגם •[	5
רורי הנפש •[	6
אסורים]	7

NOTES ON READINGS

L. 6]• הנפש. The first letter of the next word, although cannot be identified, can still be partially seen, which is clearly separated from this word. Hence, the restoration in the *PE*, הנפשו[ת, is unlikely.

TRANSLATION

1.]' on the tenth [
2.]• of Jcdaiah. On the sixte[enth of it
3. On the twenty] seventh of the month [
4.]he returned g[
5. na[tions and also •[

⁵ Cross, “Jewish Scripts”, 149, Figure 4, line 4.

6.]*ru*ry of the spirit ·[
7.]prisoners[

COMMENTS

L. 5 גוֹאִים. The editors of the *PE* restore the word כְּתִיאים twice in this manuscript, here and at 3:2, whereas in both cases an alternative restoration, גוֹאִים, is suggested by Wise.⁶ In both incidences its condition is similar with only the latter half of the word extant. With the loss of the first few letters, both proposals of restoration are possible but not certain. However, the extant evidence seems to favour Wise's suggestion. In 3:2 the fourth to last letter is preserved and it looks more like a 1 than a י. To distinguish between the 1 and the י in the Qumran manuscripts is always difficult, but in the handwriting of this manuscript the two can be identified quite confidently by the size of the hook at the top and the length of the down stroke. When compared to the 1, the י in general has a more prominent hook at the top and a relatively shorter down stroke. The letter in question in 3:2 resembles more a 1, and it looks very different from the second last letter, which is clearly a י. Snyder notes that "in the cave 4 texts כְּתִיאים occurs only five times in three manuscripts; גוֹאִים has fifty-two references."⁷ This may also favour Wise's restoration.

L. 6 רורִי. The word was originally entered in the *PC* as בַּמִּן־רורִי, but was changed by Wacholder and Abegg to אֶרֶרִי in the *PE*. Since both the reading of the word and the content of the line are uncertain, there is not sufficient information for a confident restoration of the word.

Frg. 2

לְתֵת לוֹ יָקָר בַּעֲרֻמָּה 1

⁶ M. O. Wise, *Thunder in Gemini: And Other Essays on the History, Language and Literature of Second Temple Palestine* (Journal for the Study of the Pseudepigrapha Supplement Series 15; Sheffield: Sheffield Academic Press, 1994) 188-189.

⁷ Snyder, "Mishmarot Calendars", 209, n. 44.

[•עה לשבט זה]	2
[ה שהוא עֲשִׂים בחודש]	3
[•יסוד באה של מציון •]	4
[להקביל את]	5
[ב הרקנוס מב •]	6
[להקביל]	7

NOTES ON READINGS

L. 1 בערמנה. Wise⁸ reads the fourth letter of this word as a ב, and then restores it as בערב[ים]. He suggests that the event recorded here is probably referring to Hyrcanus II seeking help from the Nabatean king in his power struggle with his brother. Wise's suggestion is an ingenious attempt to interpret the line in the historical context of the manuscript. However, his reading of the word fails to support his interpretation. A careful study of the photographs shows that the letter in question cannot possibly be a ב. Although the letter is damaged diagonally with only its upper right corner remaining, a nib mark on the left underneath the horizontal top stroke can still be clearly seen. This nib mark shows that the letter has a down stroke or a slash on its left hand side characterising most likely a מ but definitely against the reading of a ב. As a result, Wise's restoration of the word, and hence also his interpretation of the line, is rejected.

L. 6] מב •. The editors of the *PE* restore this word as מלכ, whereas Wise suggests מרד. However, neither reading is supported by the extant writing in the fragment. Whilst the third letter is almost entirely lost, the possibility of restoring the word depends on the identification of the second letter. Only the right shoulder of the letter is left. However, even that is sufficient to show that the letter cannot possibly be a ל. The remnant of the letter lacks the characteristic ascender of a ל, and the down stroke on the right inclines to the right instead of to the left as a ל normally does. And also this letter remnant does not look like a ר either. When compared with the other ר in this manuscript, the sharp right top corner shows the difference. The ר in general is

⁸ Wise, *Thunder in Gemini*, 188.

written more cursively at that corner with no distinctive bend between the horizontal and the vertical strokes. The sharp 90 degree corner of this letter resembles a כ or a ח. The reading of a letter כ is preferred here.

TRANSLATION

- 1. to] give him honour in crafti[ness
- 2.]ח of this tribe [
- 3.]ח which is the twentieth of the month [
- 4.] foundation. Shelamzion came ·[
- 5.] to visit ח[
- 6.]ב Hyrcanus מב[
- 7.] to visit [

COMMENTS

L. 2 ח·[. The restoration in the *PE*, חשעה[ח, is changed to חעה[ח by Wise,⁹ as well as by Snyder.¹⁰ The reading of the third last letter is uncertain. What is left of this letter are two minute nib marks at the top, which could be the remnant of many possible letters. Both suggestions for this word are based on the assumption that the line here contains a calendrical entry, hence both restore the word as a number. However, this assumption is not justified. Taking into consideration that this text often contains large chunks of non-calendrical description of events, this line could, or more likely is, part of the description of a historical event whose exact content can no longer be retrieved.

Frg. 3

ח·ה[	1
ג[ואים הרג <ש]>]	2

⁹ Wise, *Thunder in Gemini*, 188.
¹⁰ Snyder, “Mishmarot Calendars”, 213.

NOTES ON READINGS

- L. 2 ג[ואים]. For the reading of the word see the comment on 1:5.
- L. 2] <ש]>. The letter is found written superlinearly. Whether it is only one letter or a word/words written on top of the line is not sure. The restoration in the *PE*, ש[מעון], has no supportive evidence.

TRANSLATION

1.]*m h* [
2. the nati]ons. Killed <ש]> [
3. day]fifth in this Jedaiah [

Frg. 4

1 [ום כרצו]ן

TRANSLATION

1.]*w m* according to the wil[l

4Q323. 4QCalendrical Doc C^b (Mishmarot C^b)

(PLATES XIV)

Bibliography: J. T. Milik, "Le travail d'édition des manuscrits du désert de Juda," Volume du Congrès Strasbourg 1956 (Supplements to Vetus Testamentum 4; Leiden: Brill, 1957) 25-26; B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 79-81; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 119-127; M. O. Wise, *Thunder in Gemini: And Other Essays on the History, Language and Literature of Second Temple Palestine* (Journal for the Study of the Pseudepigrapha Supplement Series 15; Sheffield: Sheffield Academic Press, 1994) 186-221; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 315; F. García Martínez, "Calendarios en Qumran," *Estudios Bíblicos* 54 (1996) 544; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 220-241; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 694-695; B. Z. Wacholder, "Historiography of Qumran: The Sons of Zadok and Their Enemies," in F. H. Cryer and T. L. Thompson (ed.), *Qumran Between the Old and New Testaments* (JSOT Supplement Series 290; Sheffield: Sheffield Academic Press, 1998) 367.

Fragments

This manuscript has six fragments, but only four of them are included in this study. Fragment 1 has five lines with forty-four recognisable characters; fragment 2 has five lines and thirty-four characters; fragment 3 with nine lines and twenty-six characters; and fragment 4 with six lines and twenty-five characters. Although fragment 4 is about the same size and has a similar amount of recognisable characters as the other three, it only provides minimal information because most of the words on it have been damaged.

Palaeography

At least two hands, a formal and a semicursive, are noticeable in this manuscript. Whilst fragment 2 is in the formal script and fragment 3 and 4 are in the semicursive script, fragment 1 shows evidence of both hands. In fragment 1 it is obvious that the original work was done by a scribe of the formal hand (cf. lines 1, 2 and 3), whereas

another scribe of the semicursive hand corrected it by inserting interlinear lines (cf. lines 3a and 4a). The formal hand resembles the late Hasmonean or early Herodian script, and the semicursive hand is likely to be of the late Hasmonean style.¹¹

Line Correspondence Chart

Proposed			<i>Preliminary Edition</i>		
Frg.	Col.	Lines	Frg.	Col.	Lines
1		1-3	1		1-3
1		3a	1		3א
1		4			n/a
1		4a	1		4
2		1-5	2		1-5
3		1-9	3		1-9
	n/a		4		9
	n/a		5		1-2
4		1-6	5		3-8

Mus. Inv. 694
PAM 41.613, 42.333, 43.336, 43.337

Frg. 1

ה[בתשע]ה	1
ב..[]שכניה א[	2
<[בשנים ביקים •]	3a
[שֶׁה בָּהּ בִּיאָת יִקִּים וְיוֹם ר[ביעי ביקים	3
<[בכס..] יו[ם שני בחפֿא שהוֹ]א>	4a
.....[ ].....[	4

¹¹ Compare the examples in Cross, “Jewish Scripts”, 138, Figure 2, line 3, and 149, Figure 4, line 4.

NOTES ON READINGS

L. 4a $\text{בַּחֲפָא שְׁהוֹנָא}$. The reading of these two words in the *PE*, $\text{בַּחֲדוֹשׁ הַתְּשִׁיאִי}$, which is also adopted by Wise,¹² is a misreading of the extant writing in the fragment. Firstly, the ש and the ה obviously connect to each other rather than belong to two separated words. Secondly, the letter in front of the ש is definitely not a ב . The editors of the *PE* have most likely taken the base stroke of the final א in the line above as the top of a ב by mistake. Actually, the letter in front of the ש comes almost one space of a letter ahead and its remaining writing resembles most of an ש . Furthermore, to restore these two words as $\text{שְׁהוֹנָא בַּחֲפָא}$ matches with what is found in line 3 for Huppah is the priestly course following immediately after Jakim.

L. 4a. The editors of the *PE* recognise that there are some words inserted between lines 2 and 3, and they indicate this insertion as 3א, but they fail to recognise that the words in line 4a are also in the same situation. Like 3a, these words are squeezed between two lines, only in this case the situation is even more obvious. The gap between the original lines 3 and 4 is not as wide as the one above, so part of this interlinear writing is touching or overlapping with the existing words. Another piece of evidence showing that both 3a and 4a are later insertions is that the size of the letters in these two lines is obviously smaller than the other lines, and they are obviously from two different hands.

TRANSLATION

1.]h on the nin[th
2.]b·[]Shecaniah ׀
- 3a. <on the second of Jakim ·[]>
3.]ʃh of it is the entering of Jakim. And day ffourth of Jakim
- 4a. <]bks·[day] two of Huppah which [is>
4.]···[]···[

¹² Wise, *Thunder in Gemini*, 189.

COMMENTS

L. 4a בחפֿאֿ שהוֹן־א. Based on the mistaken reading, the editors of the *PE* regard this fragment as documenting something that occurred in the 8th and 9th months of the second year. Likewise Wise restores most of the missing parts of the fragment for the same period. However, since the reading is incorrect the restoration is doubtful. There is no clear evidence in the fragment that supports a definite conclusion over which period it does cover.

Frg. 2

יום רב[יְעִי בַחֲזוֹן־י]ר־[א]חד בַעֲשִׂירִי	1
בארבעה בה ביאת פ[צִץ באחד [ע]שר בִּה ביאת פתחיה	2
[בשמונה עשר בה ביא־ת־יחזקאל בַעֲשִׂרִים וחמשה בה ביאת]	3
יכין [הע[ב]ולה י־]	4
בשנים בה ביאת־[גמול]	5

TRANSLATION

1. day fou]rth of Hez[i]r is [the fi]rst of the t[enth (month)
2. On the fourth of it is the entering of Happ]izzez. On the elev[en]th [of it is the entering of Pethahiah.
3. On the eighteenth of it is the enter]ing of Jehezkel. On the twen[ty-eighth of it is the entering of]
4. Jachin.] the ser[vi]ce y[
5. On the second of it is the] entering [of Gamul

Frg. 3

]•[	1
]••[	2

ש[•]	3
ות[•••]	4
אנש[••]ים	5
ונגר אר[יסטבולוס?]	6
אמרו בע[	7
שבעים • [	8
שהוא[	9

NOTES ON READINGS

L. 1. In the *PE* a word “שהוא[”], which is not found in the photographs, is placed in this line.

L. 5. The line is misplaced as line 3 in the *PE*.

L. 6. אר[יסטבולוס?]. With only the first two letters of the word found it is difficult to confirm that the Hasmonean king, Aristobulus, is being referred to.

TRANSLATION

1.]•[
2.]••[
3.]• §[
4.]•••wt[
5.]••me[n
6.]• and against Ar[istobulus ?
7.]they said b'[
8.]seventy •[
9.]which is[

Frg. 4

ה[•]	הכש[	1
ב[•]	ה[•]	2

]ו ייה•[		3
]אב•ע[		4
]למ[]שון [		5
]שני שמ••[		6

bottom margin

NOTES ON READINGS

L. 5. The middle part of the word is missing. It is restored in the *PE* as מ[רח]שון, the Babylonian month name for the eighth month of the year, which is possible but cannot be confirmed.

L. 5-6. These two lines are misplaced as lines 7-8 in the *PE*.

TRANSLATION

1.]hks[]h[
2.]b h[
3.]w yyh[
4.]bł[]b'•[
5.]ws••[]lm[]šwn[
6.]• two šm••[

4Q324. 4QCalendrical Doc C^c (Mishmarot C^c)

(PLATES XV)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 81-82; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 119-127; M. O. Wise, *Thunder in Gemini: And Other Essays on the History, Language and Literature of Second Temple Palestine* (Journal for the Study of the Pseudepigrapha Supplement Series 15; Sheffield: Sheffield Academic Press, 1994) 186-221; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 315; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 545; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 241-248; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 696-697;

Fragments

This manuscript has two preserved fragments. The bigger one contains seven lines of a column together with a bottom margin. A total of approximately ninety characters are discernible. The small one contains only four identifiable characters in two different lines. There is writing on the reverse side of both fragments which is identified as part of another composition, 4QAccount of Money ar (4Q355).

Palaeography

The classification of this manuscript's hand is uncertain. From the limited characteristics shown in the writing it seems to be close to the early Herodian formal script.¹³

Mus. Inv. 694
PAM 41.702, 42.334, 43.336

¹³ See Cross, "Jewish Scripts", 138, Figure 2, line 4.

בעשרים ושלושה בה] ביאת [אלישיב בשלושים בה ביאת יקים]	1
[אחר שבת ביקים זה אח]ר בש[שי בשבעה בה באית חופה]	2
[בארבעה] עֶשֶׂר בה] ביאת ישבאב] ••פות בע[שרים ואחד]	3
[בה ביאת בלג]ה בעשרים [ושמונה ב]ה ביאת אמ[ר יום]	4
[רביעי באמר זה א]חד בשביעי באר[ב]עָה בה ביאת ח[זיר]	5
[יום ששי ב]חזיר שהוא עשרה בשביעי שיוֹם] הכפורים?	6
[עֶבְרִית באחד עשר בשביעי ביאת] הפצץ	7

bottom margin

NOTES ON READINGS

L. 7 [עֶבְרִית]. The reading in the *PE*, לברית, is generally adopted by the other studies, and the entry is taken as concerning something related to the covenant. However, the first letter of the word cannot be a ל for the blank space above the letter betrays its lack of the characteristic ascender of a ל. The letter looks like either an ע or an א, with ע the more probable one.

TRANSLATION

1. [On the twenty-third of it is] the entering of [Eliashib. On the thirtieth of it is the entering of Jakim.]
2. [After the Sabbath of this Jakim is the fir]st of the six[th (month). On the seventh of it is the entering of Huppah.]
3. [On the four]teenth of it is [the entering of Jushebeab] ••*pwt* On the t[twenty-first]
4. [of it is the entering of Bilga]h. On the twenty-[eighth of i]t is the entering of Imm[er. Day]
5. [fourth of this Immer is the fi]rst of the seventh (month). On the fo[ur]th of it is the entering of H[ezir.]
6. [Day sixth of] Hezir which is the tenth of the seventh (month) which is the Day [of Atonement ?

7. [] of Hebrew. On the eleventh of the seventh (month) is the entering of
[Happizzez.]

COMMENTS

L. 6 הכפורים? To restore the entry as a reference to the Day of Atonement, as the *PE* does, is undermined by the fact that the Day of Remembrance on the first day of the seventh month is not mentioned in this text.

Frg. 2

].ם ב[	1
ש[לוש]ה	2

TRANSLATION

- 1.]·m b[
- 2.]third[

4Q324a. 4QCalendrical Doc C^d (Mishmarot C^d)

(PLATES XVI)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 82-84; G. Vermes, "Qumran Forum Miscellanea I," *Journal of Jewish Studies* 43 (1992) 304; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 119-127; M. O. Wise, *Thunder in Gemini: And Other Essays on the History, Language and Literature of Second Temple Palestine* (Journal for the Study of the Pseudepigrapha Supplement Series 15; Sheffield: Sheffield Academic Press, 1994) 186-221; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 316; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 545-546; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 248-261; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 696-697; B. Z. Wacholder, "Historiography of Qumran: The Sons of Zadok and Their Enemies," in F. H. Cryer and T. L. Thompson (ed.), *Qumran Between the Old and New Testaments* (JSOT Supplement Series 290; Sheffield: Sheffield Academic Press, 1998) 367-368.

Fragments

Nine fragments of this manuscript are preserved. Four of them contain no identifiable words and hence are excluded from this study and the attached plate. Fragment 1 consists of two columns. The first column has only one word, but the remaining part of the fragment contains almost the whole extended length of the lower four lines of the next column together with a wide bottom margin. The number of characters identified in this fragment is approximately eighty-nine. Fragment 2 contains the left hand side of a column, which shows the end of eight lines together with a wide left margin. It has forty-four identifiable characters. The other three are relatively small, each containing just a few characters: fragment 3 - three lines, fifteen characters; fragment 4 - three lines, four characters; fragment 5 - one line, nine characters.

The hand of this manuscript shows characteristics which are comparable to the semicursive script of a manuscript of the Apocalypse of Weeks, ca. 50-1 BCE.¹⁴

Mus. Inv. 684
PAM 41.702, 41.703, 42.334, 43.338

Frg. 1 i

[שְׁהוּא]

3

TRANSLATION

3.]which is

Frg. 1 ii

[בְּאֵלֵּי...]	בְּעֶשְׂרִים וְאַחַד	יּוֹם...	1
[בּוֹ] אֵל בִּיאַת שְׁ[עוֹר] יִם בְּעֶשְׂרִים וְשִׁמּוֹנָה בּוֹא בִיאַת מֶלֶךְ[יָה]			2
יּוֹם רְבִיעִי [בְּ]מֶלֶךְ יָה זֶה אֶחָד בַּחֲזֹרֶשׁ הַעֲשִׂירִי vacat []			3
בְּאֵ[רְבַע] הָ בְעֶ[שְׁ] יָרִי בִיאַת מִי[מ]ן בְּאַחַד עֶשֶׂר בּוֹא ..			4

bottom margin

NOTES ON READINGS

L. 4] בּוֹא .. The restoration in the *PE*, בִּיאַת [הַקִּיץ], is in accord with the content and the standard formula used in the text. However, the problem in restoring the line as such is that the writing following after the word בּוֹא does not match with the expected word בִּיאַת. The writing makes it difficult to identify any possible letters, let alone the reading “בִּיאַת” in the *PE*.

¹⁴ Cross, “Jewish Scripts”, 149, Figure 4, line 5.

TRANSLATION

1. day ...[]bʔ...[On the twenty-first]
2. [of i]t is the entering of S[eor]im. On the twenty-eighth of it is the entering of Malchi[jah.]
3. Day fourth [in] this Malchijah is the first of the tenth month *vacat* [
4. On the f[our]th in the t[en]th (month) is the entering of Mija[m]in. On the eleventh of it is ...[

Frg. 2

ב[עשרים]	1
וְאַחַד בּוֹא בִיאַת פֶּתַחִיָּה בַעֲשָׂרִים וּשְׁמוֹנִיָּה	2
בּוֹא בִיאַת יְחֻזְקָאֵל בִּיחֻזְקָאֵל שֶׁהוּא	3
הָרֹג אֱמֶלְיוֹס	4
יוֹם רְבִיעִי בִיחֻזְקָאֵל זֶה אֶחָד בַּחֹדֶשׁ שֶׁהַשְּׁבִיעִי	5
בְּאַרְבַּעָה בּוֹא בִיאַת יָכִין בְּאַחַד עֶשֶׂר בּוֹא בִּיחֻזְקָאֵל גְּמוּלָה	6
שֶׁהוּא	7
הָרֹג אֱמֶלְיוֹס	8

TRANSLATION

1. on the]twenty
2. [first of it is the entering of Pethahiah. On the twenty-eig]hth
3. [of it is the entering of Jehezkel of J]ehezkel which is
4.]killing of Aemelius
5. Day fourth of this Jehezkel is the first of the]seventh [mon]th.
6. On the fourth of it is the entering of Jachin. On the eleventh of it is the ent]er[ing of Gamul.
7. which] is
8.]killing of Aemelius

COMMENTS

Various studies attempt to restore the missing text of this fragment. The *PE*, on the one hand, takes a minimal approach, which other than transcribing the extant writing only adds a few words in line 5 based on the text's standard formula for the beginning of the months. On the other hand are the restorations of Wise¹⁵ and Snyder.¹⁶ They restore almost the whole fragment from line 2 to 8, not only reconstructing the calendrical entries but also providing suggestions for the parts concerning the historical events. The speculative nature of such far reaching attempts in restoring the missing text is exposed by the differences between the two restorations, especially in lines 7-8. This study adopts the extent of restoration put in by the editors of the *SE*, that is only reconstructing the missing parts of the calendrical entries.

Frg. 3

ש[] • אצ••]	1
בעשרים ושמונה בה ביאת י[שוע יום רביעי] בישוע זה אחד בחודש	2
העשירי] שה[וא עש]רה	3

TRANSLATION

1.]ש[] • אצ••]
2. On the twenty-eighth of it is the entering of Je]shua. Day four[th of this Jeshua is the first of the month]
3. [tenth. which i]s the ten[th

COMMENTS

Although only a few words are found in this fragment, to restore it with the ninth and the tenth months of the sixth year of the sexennial cycle is still possible because

¹⁵ Wise, *Thunder in Gemini*, 190.

¹⁶ Snyder, "Mishmarot Calendars", 252.

for the first day of the month to fall on the fourth day of the week with Jeshua on duty would only happen at this time of the cycle.

Frg. 4

]....[	1
בש[נים ב[	2
]ל[	3

TRANSLATION

- 1.]....[
- 2. On the se]cond of [
- 3.]ל[

Frg. 5

]איש יהודי א[1
---------------	---

TRANSLATION

- 1.]a Jewish man ך[

4Q324b. 4QCalendrical Doc C^e (Mishmarot C^e)

(PLATES XVII)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 84-85; G. Vermes, "Qumran Forum Miscellanea I," *Journal of Jewish Studies* 43 (1992) 304; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 119-127; M. O. Wise, *Thunder in Gemini: And Other Essays on the History, Language and Literature of Second Temple Palestine* (Journal for the Study of the Pseudepigrapha Supplement Series 15; Sheffield: Sheffield Academic Press, 1994) 186-221; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 316; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 546; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 262-264; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 698-699; B. Z. Wacholder, "Historiography of Qumran: The Sons of Zadok and Their Enemies," in F. H. Cryer and T. L. Thompson (ed.), *Qumran Between the Old and New Testaments* (JSOT Supplement Series 290; Sheffield: Sheffield Academic Press, 1998) 368.

Fragments

This manuscript is written on papyrus. It has approximately fifteen fragments preserved, but most of them are very small and fragmentary and only one or two of them have any useful information. Fragment 1 is designated as two separate fragments in the *PE* but in the final photograph, 43.335, these pieces have been put together to form a single fragment. The combined fragment is the largest and most important one of the manuscript. It shows some seven lines and a possible bottom margin. The number of characters which can be identified in this fragment is approximately twenty-seven. Another fragment which has been included in the following study is fragment 2. It has only two recognisable characters, but it is included because of the possibility that it might contain one of the priestly names.

This manuscript was copied by a semicursive hand of the late Hasmonean period.¹⁷ Although not many recognisable letters are found in this manuscript, the characteristics of a few letters are enough to help its classification according to the categories set out by Cross.

Line Correspondence Chart

Proposed			Preliminary Edition		
Frg.	Col.	Lines	Frg.	Col.	Lines
1		5-7	= /	1	3-4
			\	2	4-5
2		1		3	1

Mus. Inv. 302
PAM 41.989, 42.069, 43.335

Frg. 1

]•• ••[	1
] מן ••[	2
] ••[	3
] ••[ ]• ••[	4
]ם אנוש]ם ו•[	5
]ת הזו"י]כֹהֵן אֲשֶׁר כֹּל[	6
]שלמצ<י>אן]יוחנן להבי אל[	7

bottom margin?

¹⁷ Cross, "Jewish Scripts", 149, Figure 4, line 4.

NOTES ON READINGS

L. 6 אֲשֶׁר כֹּהֵן גְּדֹלָה. The *PE*'s restoration of “גְּדֹלָה” predated the final reconstruction of the fragments in PAM 43.335. The first letter of the second word could be a ג but it could also be a נ or a ה. However, its last letter cannot possibly be a ל for the final stroke of a ל tends to incline to the left and to be much shorter. The remnant of this letter can therefore only be confirmed as a ה.

TRANSLATION

1.].. ..[
2.].. from [
3.]..[
4.].. .[]..[
5.]m w[]m a man [
6. the] priest who all[]t hzyw[
7.]Yohanan to bring to []Shelamzion[

COMMENTS

Two separate pieces are joined together as a single fragment in the final photograph (PAM 43.335). In this composite fragment 1 a gap of blank space runs from top to the bottom. This gap is understood by some studies¹⁸ as a margin separating two columns. However, a closer examination of the photograph shows that it is more likely to be a single column but with a band of eroded text. A few hints support this possibility. First, at some points, such as line 5, this empty band is very narrow, indeed no wider than the word separators. Second, the right hand edge of what is supposed to be the second column is highly uneven with some lines having almost two letters ahead of the others. Third, the single letter ה at line 6 cannot possibly be the beginning of a line. The *PE* has הנ instead of ה, but the נ is clearly not there. If one assumes the נ is lost and needs to be restored, then once it is replaced this gap of supposed margin would disappear.

¹⁸ For examples see the *SE* and Wise, *Thunder in Gemini*, 191.

Frg. 2

יחזקאל] 1

NOTES ON READINGS

L. 1 יחזקאל? Restoring the word as the priestly name is only conjectural.

TRANSLATION

1. ?Jehez]kel

4Q324c. 4QCalendrical Doc C^f (Mishmarot C^f)

(PLATES XVIII-XIX)

Bibliography: F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 698-699; Foundation for Ancient Research and Mormon Studies, Brigham Young University, Provo, Utah, *Dead Sea Scrolls Electronic Reference Library, 2* (CD-ROM; Leiden: Brill, 1999).

Fragments

This manuscript is extremely fragmentary. A total of sixty-one fragments can be found on the final photographs. All the fragments are very small and most of them have no recognisable characters. Even the largest ones, fragment 12 and fragment 46, can yield no more than sixteen characters. Only eighteen of the fragments are included in this study. The numbering of the fragments is according to the order of the transcription of the text in the Dead Sea Scrolls CD-ROM (*DSSCD*) of the Foundation for Ancient Research and Mormon Studies.¹⁹

Palaeography

Whilst studying another Cryptic A manuscript, Pfann has assigned some scrolls written in this esoteric script to two different stages with observable tendencies of development of the script. He classifies 4Q317 and 4Q249 as an earlier stage of around the late second century BCE, and 4Q298 as a later stage of the first century BCE.²⁰ Based on the observation set down by Pfann the handwriting of this manuscript shows signs of both stages. Therefore it is likely to be a product during this process of development. The manuscript can be tentatively dated to the late second century or early first century BCE.

¹⁹ Foundation for Ancient Research and Mormon Studies, *Dead Sea Scrolls Electronic Reference Library, 2*.

²⁰ S. J. Pfann, "4Q298: The Maskil's Address to All Sons of Dawn," *Jewish Quarterly Review* 85 (1994) 203-235, 216.

Mus. Inv. 241

PAM 40.979, 40.975, 40.935, 40.619, 41.867, 41.692, 41.643, 41.461, 41.410,
41.372, 42.430, 42.429, 43.333, 43.340

Frg. 1

שש[	1
חמי]שי	2

NOTES ON READINGS

L. 2 חמי]שי. *DSSCD*: חמי].

TRANSLATION

1.]ס[
2. fif[th

Frg. 2

י•[	1
תקוצ] [	2
שב]ת	3

TRANSLATION

1.]w[
2.] *tqws*[
3.] sabba[th

Frg. 3

שבת בא[	1
שבת •ח•[	2

TRANSLATION

1.]sabbath on the ʾ[

2.] sabbath ·h·[

Frg. 5

]	ה	[	1
	אלי	[	2
	ב	[	3

NOTES ON READINGS

L. 2 אלי[שיב? Reading the word as the priestly name is only conjectural. Another possible case of finding the priestly name in this manuscript is in fragment 14, but that is also a speculative restoration.

TRANSLATION

- 1.]h[
- 2.] Elia[shib ?
- 3.]b[

Frg. 12a

]	ו	[	1
	ב	[	2
	שבת	[	3

TRANSLATION

- 1.]w[
- 2. in the] seve[n]th[
- 3.]sabbath [

COMMENTS

Fragment 12 is entered in the *DSSCD* as two columns with a vertically written line in between. However, the connection between the two segments in this composite fragment is questionable. Although the connection could be justified by the

continuation of the vertical line, the joint between the segments does not appear to fit. In addition, the segment on the right is obviously darker than the one on the left. Furthermore, in order to align the vertical line the segment on the right has to be rotated slightly anti-clockwise, causing its lines to bend upward. Under these points of doubt, the two segments should be regarded as two separate fragments and are thus designated as 12a and 12b in this study. The vertical line is listed as]רנפ?ש[in the *DSSCD*, but most of the letters are actually unrecognisable.

Frg. 12b

ושמו]נה	1
יום הש[	2
י]ום ר[ביעי	3

NOTES ON READINGS

L. 2. In the *DSSCD* the line is entered as יום ש[שי. However, the first letter following the word יום is clearly a ה, and the following letter although it can only be partially read is distinctively a ש. In the *DSSCD* the three lines in this fragment are restored to cover a period from 28/6 to 15/7 including all the sabbaths, the Day of Atonement, and the Feast of the Booths.

TRANSLATION

1. eigh[th
2. day hš[
3. d]ay f[ourth

Frg. 13

]•[	1
ש[ביעי ב]	2

TRANSLATION

1.]·[
2. se]venth of [

Frg. 14

ת[שע]ה	1
] בל'גה ?	2

NOTES ON READINGS

L. 2 בל'גה?. Only the last two letters of the word are preserved. Restoring it as the priestly name is possible but cannot be confirmed.

TRANSLATION

1. n]in[th
2. ? Bil]gah[

Frg. 21

]א·[	1
ע[שר בו י·]	2
] באחד עשר	3

TRANSLATION

1.]··[
2.]tenth of it γ[
3.]on the eleventh [

Frg. 22

]קר[	1
]זורכמ[	2
ב[ן שבת ב]	3

TRANSLATION

- 1.]·qr [
- 2.]·zwrkm[
- 3. of] it is a sabbath. On[

Frg. 26

1] שלו>ש ימ]

TRANSLATION

- 2.] thirty [

Frg. 30

1]שבת[

TRANSLATION

- 1.]sabbath[

Frg. 31

1]....[

2]שבת[

3]ב·[

TRANSLATION

- 1.]....[
- 2.]sabbath[
- 3.]ב·[

Frg. 32

1]...[

2]בו שבת[

TRANSLATION

1.]...[
2.]of it is a sabbath[

Frg. 34

ב[ו שבת הֶ]	1
י[ומ הרֶב]יעי	2
]••[	3

NOTES ON READINGS

L. 2 י[ומ הרֶב]יעי. *DSSCD*:]ומ? רב[.

TRANSLATION

1. of]it is a sabbath. *h*[
2. d]ay fou[rth
3.]••[

Frg. 43

]וש[	1
•[בו חג]	2
]••[ ]••[	3

TRANSLATION

1.]wʕ[
2.]• of it the Festival of[
3.]••[]••[

Frg. 46

שבת בש[לושי]מ בו שבת בשבעה	1
בשלישי שב[ת באר־ב־עה]ן עשר בו	2

שבת]בַּחֲמִשָּׁה עָשָׂר בּו חַג הַשְּׁבֻעִים	3
בְּיוֹם	4

NOTES ON READINGS

L. 4. בְּיוֹם. The line is written upside down.

TRANSLATION

- sabbath. On the th]irtieth[h of it is a sabbath. On the seventh
- of the third (month) is a sabba]th. On the four[teenth of it is a
- sabbath.] On the fifte[enth of it is the Feast of the Weeks.
- on the day

COMMENT

The restoration in the *DSSCD* is adopted in general but with a few modifications. Firstly, בַּשְּׁלִישִׁי is added at the beginning of line 2 replacing בּו. Secondly, חַג הַשְּׁבֻעִים is restored in line 3 instead of חַג סוּכּוֹת. Thirdly, line 4 is read as בְּיוֹם instead of בְּגוֹפ. Restoring the content of the fragment as the third month of the year with the Feast of the Weeks matches better with the preserved words.

Frg. 47

]	••[	1
בַּעֲשָׂרִים	] וְאַחַד בּו שַׁבָּת	2
בַּעֲשָׂרִים וַעֲשָׂרִים	] מִזְמֶנָּה בּו שַׁבָּת	3

TRANSLATION

-]••[
- On the t]wenty-[first of it is a sabbath.
- On the twenty-ei]ghth [of it is a sabbath.

][•ב[	1
][שבת[	2

NOTES ON READINGS

L. 2][שבת[. *DSSCD*:][סב? [. The reading of the word is certain.

TRANSLATION

- 1.][•ב[
- 2.][sabbath[

4Q325. 4QCalendrical Doc D (Mishmarot D)

(PLATES XX)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 86-87; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 127-128; S. Talmon, "A Calendrical Document from Qumran Cave 4 (mishmarot D, 4Q325)," in Z. Zevit, S. Gitin, and M. Sokoloff (ed.), *Solving Riddles and Untying Knots: Biblical, Epigraphic, and Semitic Studies in Honor of Jonas C. Greenfield* (Winona Lake, Indiana: Eisenbrauns, 1995) 327-344; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 317-318; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 546-548; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 265-282; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 698-701.

Fragments

This manuscript has three fragments, two large ones and a small one. Fragment 1 consists of two parts, a large piece with a very small one neatly attached to its lower right corner. Talmon designated these two as fragment (a) and fragment (c). However, he does consider fragment (c) as part of fragment (a). This composite fragment contains almost a complete column. The right top margin, the bottom margin, and part of the left hand margin have been preserved. Judging from the content the right hand side should have no more than a few missing characters for the lines. The column has seven lines and the extended length of each line is estimated to hold an average of approximately forty-five spaces, including characters and separators. At the bottom part of the fragment is a natural defect in the material which has forced the scribe to write the bottom line beginning near the last third of the line. A total of one hundred and eighty-two characters can be found in this fragment. Fragment 2 contains the left hand end of seven lines of a column. Both the left margin and part of the top margin can be seen. It has forty-nine identifiable characters. Fragments 1 and 2 (= Talmon's fragment (a), (b), and (c)) are placed together by Talmon as part of three reconstructed columns. The last fragment 3 (= Talmon's

fragment (d)) is a very small one showing four lines with approximately twelve characters.

Palaeography

The handwriting of this manuscript is classified by Talmon as an “early formal Herodian script”, and dated to the last third of the last century BCE.²¹

Line Correspondence Chart

Proposed			Preliminary Edition			Talmon		
Frg.	Col.	Lines	Frg.	Col.	Lines	Frg.	Col.	Lines
1		1-7	1		1-7		i	1-7
2		1-7	2		1-7		iii	1-7
3		1-4		n/a		d		1-4

Mus. Inv. 226
PAM 40.618, 41.701, 42.332, 43.333

Frg. 1

<i>top margin</i>	
ביום שלי]שי בשמונה עשר בו שבת ע[ל יורירב	1
[בְּעָרְבַּ בַּעֲשָׂרִים וַחֲמִשָּׁה בּו שַׁבָּת עַל יִדְעִיה וְעָלוּ	2
[מוֹעֵד] הַשְּׁעוּרִים בַּעֲשָׂרִים וַשְּׁשָׁה בּו אַחֲר שַׁבָּת רוֹשׁ הַחֹדֶשׁ הַשְּׁנִי	3
[בְּיוֹם שֵׁנִי עַל יִדְעִיה בְּשָׁנִים בּו שַׁבָּת חָרִים בַּתְּשַׁעָּה בּו שַׁבָּת	4
[שְׁעוּרִים] בַּשְּׁשָׁה עָשָׂר בּו שַׁבָּת מַלְכִּיה בַּעֲשָׂרִים וְשְׁלוֹשָׁה בְּ[ו]	5
[שַׁבָּת מִיָּמִין בְּשְׁלוֹשִׁים בּו שַׁבָּת הַקּוֹץ vacat רוֹשׁ הַחֹדֶשׁ	6
הַשְּׁלִישִׁי אַחֲר שַׁבָּת vacat	7
<i>bottom margin</i>	

²¹ Talmon, “mišmarot D, 4Q325”, 334. See the example set by Cross for this type of script in “Jewish Scripts”, 138, Figure 2, line 4.

L. 1 **הַשְּׁנֵה הָרִאשׁוֹנָה**. Talmon's restoration for these two words is **בְּיוֹם שְׁלִי**.²² He argues that the last legible letter of the word is undoubtedly a ה and that the preceding one is a partially preserved י, and hence dismisses the reading of the *PE*. However, Talmon's reading is not as secure as he claims. In fact, a careful study of the photographs is more likely to support the reading the other way round. The writing of the word's last letter does not match a ה but closely resembles a י. The ה in this manuscript has a flag like triangle on the top left corner similar to the י, but this triangle is always flatter, closer to the top and occupying no more than one third of the length of the vertical stroke. For the letter in question the inclined stroke forming the left hand side of the triangle is too steep when compared with the ה but well matches a י or י. Similarly, because of this steep inclined stroke the horizontal base of the small triangle also appears too far down when compared with the other ה. However, the reading of this letter as a י is supported by its resemblance with the other י in the column, such as those in **בְּעֶשְׂרִים** and **מִלְכִּיהָ** of line 5. The identification of the letter in front is not so certain. The reading of a ש is possible but not without problems. It lacks at the bottom the characteristic tip where the two side stems of the ש meet, and its middle stroke appears too close to the left stem. However, it is still more probable than Talmon's reading of a י.

L. 2 **וְעָלָו**. In the *PE* this is read as **וְעָלִי**, which is not supported by the extant evidence. The blank space following the fourth preserved letter of the word is wide enough to show that there is no fifth letter following. Furthermore, the fourth letter is more likely to be a י rather than a י as shown by the open hook at the top. In this manuscript a י in most cases has a short horizontal stroke which makes the hook at the top form a small closed triangle, whilst a י is almost always characterised by an open hook.

²² Talmon, "mišmarot D, 4Q325", 335.

L. 4 שִׁי[שִׁי בְיוֹם]. Although the editors of the *PE* indicate that the last two letters are damaged but clear, שִׁי[שִׁי], the remnant traces do not confirm this reading. What is found with these two letters are only two very small nib marks, which could be the remnant of any letter. Therefore the restoration is more a consideration of interpretation than the reading of the extant texts. As opposed to the *PE*, Talmon²³ proposes an alternative reconstruction for the beginning of this line, בְּשֵׁשֶׁת בּוֹ.

L. 7. The first two-thirds of this line is cut away as the bottom edge of the page curved up probably due to a natural defect of the parchment. In order to avoid this defect the scribe wrote only in the rear one-third of the line with three words, which follow after the words at the end of line 6.

TRANSLATION

1. [on the day thi]rd. On the eighteenth of it is the sabbath up[on Jehoiarib.
2.] in the evening. On the twenty-fifth of it is the sabbath upon Jedaiah. And upon it
3. [is the Festival of] Barley on the twenty-sixth of it after the sabbath. First of the se[cond] month
4. [is on day sixth] upon Jedaiah. On the second of it is the sabbath of Harim. On the ninth of it is the sabbath of
5. [Seorim.] On the sixteenth of it is the sabbath of Malchijah. On the twenty-third of [it]
6. [is the sabbath of Mi]jamin. On the thirtieth of it is the sabbath of Hakkoz.
vacat First of the third
7. *vacat* month is after the sabbath

COMMENTS

L. 2. Most of the studies follow the *PE* in restoring at the beginning of this line בְּיוֹם שְׁלִישִׁי, which is based on the assumption that the following בְּעֶרֶב is referring to the time when the Passover festival ends. Wise, Abegg, & Cook even translate here

²³ Talmon, “mišmarot D, 4Q325”, 338.

“Passover ends on the third day in the evening”.²⁴ However, there is no other reference among the Calendrical Documents for the ending of this festival. Therefore, there is no substantial ground for the restoration. Talmon has his own idea about the content in the lacuna. He thinks that the text breaks off after the priestly name Jehoiarib in line 1 leaving a gap of approximately thirty blank spaces until the word בערב in line 2.²⁵ Talmon’s suggestion is unacceptable also. According to his interpretation the word בערב is considered attached to the line above forming the last word of the sentence. It is hard to explain why the author needed to leave a gap of thirty spaces before he finished his sentence. Therefore for the missing words in the lacuna it is best to agree with Talmon’s other suggestion that “these lines contained a portion of text that can no longer be retrieved.”²⁶

L.2 ועלו. Talmon sees the word על as “a technical term which defines the entrance of a priestly course into the temple to begin its service”,²⁷ a parallel to the term ביאת used in other Calendrical Documents (4Q322-324a), and translates it as “the sabbath on which enters Jehoiarib”. This particular interpretation, although possible, is unlikely. The most probable interpretation of the word is that it is a preposition meaning “upon”. However, there is one possible objection to this interpretation, that is that the last word in line 2 does not match the form of the preposition when a 3ms suffix is attached to it - it should be עליו instead of עלו. This can be answered in that the form in line 2 is a Qumran orthographic variant to the usual form. In Qumran orthography על is not always found written with the suffixes of a plural noun.²⁸ Qimron spots the interchangeability of ל- and לו- as a regular feature in the Qumran corpus,²⁹ and suggests that the variation is due to phonetic grounds.

²⁴ Wise, Abegg, & Cook, *A New Translation*, 317.

²⁵ Talmon, “mišmarot D, 4Q325”, 338.

²⁶ Talmon, “mišmarot D, 4Q325”, 338.

²⁷ Talmon, “mišmarot D, 4Q325”, 337.

²⁸ E. Qimron, *The Hebrew of the Dead Sea Scrolls* (Harvard Semitic Series 29; Atlanta: Scholars Press, 1986) §322.141.

²⁹ E. Qimron and J. Strugnell, *Qumran Cave 4 V: Miqṣat Ma‘aṣe Ha-Torah* (DJD 10; Oxford: Clarendon, 1994) 70, §3.2.2.1.

The closest case for the similar usage of the word here is perhaps in the reading of ע[ל] in 4Q394 A19.

Frg. 2

top margin

בשנים בו שבת א[מֶר בש[ל] ושה בֹּ	1
[מועד התיירוש אחר שבת אמר ב[תשעה בו שבת חזיר	2
[בששה עשר בו שבת הפצין בעשרי]ם ושלשה בו שבת	3
[פתחיה בשלושים בו שבת יחזקאל רן]ש הֶחֱזַרש הששי	4
[אחר שבת יחזקאל בשבעה בו שבת יכין בארב]נה עשר	5
[בו שבת גמול בעשרים ואחד בו שבת דליה בעשרים ו]שנים	6
[בו מועד השמן אחר שבת דליה קרבן הע]צים	7

NOTES ON READINGS

L. 6 [שנים ו]. In the *PE* the few legible letters at the end of this line are omitted, but in lieu of this the whole word is restored at the beginning of the next line.

TRANSLATION

1. On the second of it is the sabbath of I]mmer. On the th[ir]d of it
2. [is the Festival of New Wine after the sabbath of Immer. On the] ninth of it is the sabbath of Hezir.
3. [On the sixteenth of it is the sabbath of Happizzez. On the twen]ty-third of it is the sabbath
4. [of Pethahiah. On the thirtieth of it is the sabbath of Jehezkel. Fir]st of the sixth month
5. [is after the sabbath of Jehezkel. On the seventh of it is the sabbath of Jachin. On the fou]rteenth
6. [of it is the sabbath of Gamul. On the twenty-first of it is the sabbath of Delaiah. On the twenty] second

7. [of it is the Festival of Oil after the sabbath of Delaiah.

the Offering

of W]ood

COMMENTS

L. 7 מועד השמן. The name of this festival is reconstructed as מועד היצהר in the other studies. The decision to restore it as מועד השמן is based on the entry found in 4Q327 1 ii 3-6, the only preserved reference of the festival in the Calendrical Documents.

Frg. 3

ש]בת ב]לגה

1

רן]ש הַחֹדֶשׁ

2

אֱלֹהֵי מ]

3

ש]ר

4

TRANSLATION

1. the sa]bbath of B[ilgah
2. Fir]st of the mon[th
3.]^ʾlh m[
4.]šr[

COMMENTS

This very small fragment is not included in the *PE*. Talmon assigns it as fragment (d) and provides a brief study on it.³⁰ Talmon’s readings are adopted here in general.

³⁰ Talmon, “mišmarot D, 4Q325”, 331-2.

4Q326. 4QCalendrical Doc E^a (Mishmarot E^a)

(PLATES XXI)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 88; F. García Martínez, “Calendarios en Qumran,” *Estudios Bíblicos* 54 (1996) 548-549; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 318; G. Snyder Jr., “Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence” (PhD Thesis, Hebrew Union College, 1997) 284-290; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 700-701.

Fragment

Only one fragment of this manuscript has been found. It contains the beginning of five lines together with a wide right margin. The number of recognisable characters is 55.

Palaeography

The small number of sample letters makes the palaeographic classification of this manuscript difficult. Based on the limited information found the handwriting of the manuscript seems to mostly resemble a late Hasmonean or early Herodian book hand (ca. 50-25 BCE).³¹

Line Correspondence Chart

Proposed			Preliminary Edition		
Frg.	Col.	Lines	Frg.	Col.	Lines
1		1	1		18
1		2-6	1		1-5

Mus. Inv. 693
PAM 41.703, 42.335, 43.339

³¹ Cross, “Jewish Scripts”, 138, Figure 2, line 3.

Frg. 1

ברא[שון רואש החודש	1
באחד ברביעי[בארבעה בו שבת]	2
בא- בו שב[ת ב-] בו הפסח יום שלישי ב-] בו]	3
חג המצות יום רבי[עי ב-] בו שבת ב3] בו]	4
שבת ב3] בו מועד ש[עורים אחר שבת סוף החודש]	5
ב3- vacat בשני רוא[ש החודש באחד בששי	6

NOTES ON READINGS

L. 1 ברא[שון. Only very faint marks of the first three letters can be seen on this line. In the *PE* they are regarded as an erasure - {{ברב>יעי}}. However, it could also be, as Snyder suggested, that the ink has faded due to exposure to water over the years.³² The reading of the first two letters as ב and ר is more or less certain. The third letter is difficult to judge, but it is more likely to be a א than the ב suggested in the *PE*.

L. 3 בא-/. This is an unusual representation of a combination between a numeral and a preposition ב; between the cipher number 11 and the preposition ב an א is inserted. Probably the scribe intended to spell the number in full but due to some unknown reason after writing the א for אחד עשר suddenly decided to change to use ciphers for his text, and he did not take the trouble to erase or cross out the erroneous written letter.

L. 3-4 By mistake the editors of the *PE* restore at the beginning of these two lines [שבת] and [ובערב ב15] respectively. The right margin of these lines is preserved, and the existing writings can be clearly seen forming the initial part of these lines. Any restoration of the missing words can only be put at the end of the lines rather than at their beginning.

³² Snyder, "Mishmarot Calendars", 285.

L. 6 ^ובִּזְ. This is entered as “3[1]” in the *PE*. The letter in front of the number is uncertain, but a ב is obviously a better choice than a ל because in the preserved text of this manuscript all numbers are preceded by a ב but none are by a ל. Also the number is certain to be thirty instead of thirty-one. All that can be read for the cipher number is the top of two symbols representing ten and twenty respectively. Although the lower half of these symbols and the following spaces has been worn off, if there was any numeric symbol following these two the top of it should be able to be seen next to them. Judging from the other cipher numbers in lines 3 and 5 of the fragment, the strokes representing the single units are all written at the same level, if not higher, with the decimal symbols. So it is not possible to reconstruct a “1” after the number “30”.

L.6 רוא]ש החודש באחר בששי. The restoration is based on the wording found in line 2.

TRANSLATION

1. In the fir[st (month) the beginning of the month is
2. on the first, (which is) on the four[th (of the week). On the fourth of it is a sabbath]
3. On the 11 of it is a sabba[th. On the 14 of it is the Passover, day third. On the 15 of it is]
4. the Feast of Unleavened Bread, day four[th. On the 18 of it is a sabbath. On the 25 of it is a]
5. sabbath. On the 26 of it is the Festival of B[arley, after the sabbath. The end of the month is]
6. on the 30.[] *vacat* In the second (month), the beginn[ing of the month is on the first, (which is) on the sixth (of the week).

COMMENTS

L.1 ברא]שון רואש החודש. If this line is not an erasure but rather original writing faded by time, it is likely to be associated with the initial words of line 2 marking the

beginning of the first month. The restoration is supported by the first entry of the second month in line 6.

L.2 באחד ברביעי. The reading of these two words in line 2 is certain and agreed by all the transcriptions, but their interpretation is not so, for example:

“On the first (month). On the four[th of it is a Sabbath.” - (Snyder)

“ In the first month of the four[th year,” - (Wise, Abegg, and Cook)

“In the first of the four[th” - (SE)

Both of the words are numbers, and in the calendrical texts a number can represent the order of a monthly day, a weekday, a month, or a year. The decision to translate the first number, באחד, as a day of the month and the second number, ברביעי, as a weekday is based on the following considerations.

- (1) The words seem to be related to an entry for the beginning of the first month. As the restored lines 3-6 show, the fragment is recording calendrical entries for the first month and line 2 should have contained some calendrical entries for the first ten days of the month.
- (2) Since no priestly name is found in the fragment and the restored text also does not allow the reconstruction of names into it, the text is unlikely to involve the sexennial priestly cycle. For the Qumran calendar if the priestly roster is not considered being used a single year is sufficient for recording any of its calendrical particulars. This makes the interpretation of any number in the manuscript as the order of the year highly unlikely.
- (3) The Calendrical Documents demonstrate some general rules for using numbers in alphabetic forms. They only use ordinal numbers for the order of the months or the years, and only cardinal numbers for the days of the months, but both for the weekdays. If these general patterns are to be followed the first number in line 2 is unlikely to stand for either the year or the month, and the second number is not a day of a month.

L.2 בארבעה בו שבת. No restoration of the missing words is provided for this line in the *PE*. Judging from the content of the text there should be no doubt that the entry about the first sabbath of the first month is in this line.

L. 3 [בן] שב[ת ב-] בן הפסח יום שלישי ב-] בן] The restoration is based on two assumptions. First, the text records all the major festivals, therefore the Passover should be included. Second, the formula used for the festive entries should bear three elements - the date, the name, and the weekday, as reflected by combining the two partially preserved festive entries in line 4 and 5.

L. 4 [בן] שב[ת ב-] בן שב[ת ב-] בן] Restoring the end of this line with the two sabbaths falling between the Feast of Unleavened Bread and the Festival of Barley fits well both in terms of the content and the space available.

L. 5 [בן] שב[ת ב-] בן] In order to restore the end of this line one first has to make sense of what is written at the beginning of the next line. The number heading line 6 could only possibly be understood as the day of the month. Situated between the Festival of Barley on 26/1 and the beginning of the second month, the most probable calendrical entry recorded here is the end of the first month, and this matches with the number "30" in line 6. Therefore what constitutes the end of line 5 should be part of an entry recording the end of the first month. The restoration שב[ת ב-] בן] is only conjectural but it is based on two considerations. First, it is so reconstructed as to resemble the term שב[ת ב-] בן] of the entry for the beginning of the month. Second, the word שב[ת ב-] בן] is used in another Calendrical Document 4Q319 to mark the end of each jubilee cycle.

4Q327. 4QCalendrical Doc E^b (Mishmarot E^b)

(PLATES XXII)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 89-91; R. H. Eisenman and M. O. Wise, *The Dead Sea Scrolls Uncovered* (Shaftesbury: Element, 1992) 182-193; E. Qimron and J. Strugnell, *Qumran Cave 4 V: Miqsat Ma'ase Ha-Torah* (DJD 10; Oxford: Clarendon, 1994) 7, 44-45; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 319-320; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 548-550; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 290-316; J. C. VanderKam, "The Calendar, 4Q327, and 4Q394," in M. Bernstein, F. García Martínez, and J. Kampen (ed.), *Legal Texts and Legal Issues* (Leiden: Brill, 1997) 179-194; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 700-703.

Fragments

This manuscript has two fragments, both are substantial in size and contain comprehensive information. It is written in very narrow columns, with an average of six to seven characters each. Fragment 1 has two columns and an inter-column margin almost as wide as the columns themselves. The first column has six lines and the second column has eight. The number of characters in it altogether is sixty-three. Fragment 2 contains three columns and the margins on the left, right, and between them. The number of lines preserved for each column is four, eight, and eleven respectively, and the total number of recognisable characters found are ninety-eight. The formation of fragment 2 was by attaching two fragments together. The connection between these two, which separates column 2 and 3 of this fragment, is not entirely satisfactory. Hence the relative position of these columns is still questionable.

Palaeography

Qimron has assigned this manuscript hand to the Herodian vulgar semiformal school, comparable to the exemplar of Numbers (4QNum^b) set out by Cross.³³ The period of this script is ca. 30 BCE - 20 CE.

Line Correspondence Chart

Proposed			Preliminary Edition			DJD 10		
Frg.	Col.	Lines	Frg.	Col.	Lines	Frg.	Col.	Lines
	n/a		1	i	4		iv	2
1	i	4-10	1	i	5-11		iv	3-9
	n/a		1	ii	1		iv	17
1	ii	1	1	ii	2		iv	18
1	ii	2-10	1	ii	3-11		v	1-9
	n/a		2	i	3		i	3
2	i	4-8	2	i	4-8		i	4-8
2	ii	1-8	2	ii	1-8		ii	1-8
2	iii	1-11	2	iii	1-11		iii	1-11
	n/a		2	iii	12		iii	12

Mus. Inv. 693

PAM 41.703, 42.335, 43.339, 43.521

Frg. 1 i

בִּשְׁשֵׁ אֲשֶׁר	4
בּוֹ שֶׁבַת	5
בַּעֲשֶׂרֶם	6
וּשְׁלוֹשָׁא	7

³³ Qimron and Strugnell, *DJD 10*, 3. For the exemplar see Cross, "Jewish Scripts", 138, Figure 2, line 5.

בֹּ שַׁבָּת	8
[בש] ל וְשִׁיִּם	9
[בו שבת]	10

TRANSLATION

- 4. On the sixteenth
- 5. of it is a sabbath.
- 6. On the twenty-
- 7. third
- 8. of it is a sabbath.
- 9. [On the thi]rtieth
- 10. [of it is a sabbath.]

COMMENTS

L. 4 אֶשֶׁר. What is recorded in this line is undoubtedly the number 16, so could אֶשֶׁר be a misspelling or an orthographic variant? The *PE* and the *SE* regard this as a mistake and offer a correction for it. However, Qimron and Strugnell³⁴ regard it as a variant on phonetic grounds - the weak pronunciation of the gutturals. Another occurrence of the word in the fragment has the usual spelling of עֶשֶׂר (2 iii 5).

L. 7 וְשָׁלוֹשָׁה. Here is another example of this manuscript’s orthographic variant. The same word is spelled with a different ending in 2 i 5, וְשָׁלוֹשָׁה.³⁵

Frg. 1 ii

[וְאַחַד]	1
בו שַׁבָּת	2
בַּעֲשָׂרִים	3

³⁴ Qimron and Strugnell, *DJD 10*, 45.

³⁵ Qimron notices that in Qumran Hebrew the א is also used as the ה is at the end of words to indicate the final sound *a, e*. Qimron, *The Hebrew of the Dead Sea Scrolls*, §100.7; and Qimron and Strugnell, *DJD 10*, 68, §3.1.4.2.

ושנים	4
בו מועד	5
השמן	6
אח[ר הש]בֿתֿ	7
אֶחָ[ריו]	8
קרֿבֿ[ן]	9
[העצים]	10

NOTES ON READINGS

L. 1 [ואחד]. An ink mark is found immediately on top of the ש in line 2. Strugnell and Qimron ignore this unidentifiable mark, and put line 2 as the top of this column.³⁶

L. 8 אֶחָ[ריו]. Only a few dots of the first two letters are found. The reconstruction of *DJD 10* is adopted here for its better match with the remnant traces. In the *PE* the proposed reconstruction is [בשני].

TRANSLATION

1. [first]
2. of it is a sabbath.
3. On the twenty-
4. second
5. of it is the Festival of
6. Oil,
7. aft[er the sabba]th.
8. Af[ter it is]
9. the Offer[ing of
10. Wood.]

³⁶ Qimron and Strugnell, *DJD 10*, 7 and 44.

COMMENTS

L. 8 אֲחִי[רִין]. Although the reconstruction of this line is different between *DJD 10* and the *PE*, both the editors put the Wood Offering on the day immediately after the Festival of Oil, a hypothetical suggestion of Yadin.³⁷

Frg. 2 i

בְּעֶשְׂרִים	4
וּשְׁלוֹשָׁה	5
בּו שַׁבָּת	6
[ב]שֶׁל[וֹשִׁים]	7
[בּו שַׁבָּת]	8

TRANSLATION

- 4. On the twenty-
- 5. third
- 6. of it is a sabbath.
- 7. [On the] thir[tie]th
- 8. [of it is a sabbath.]

Frg. 2 ii

[ו]אֲחִי[ד]	1
[ב]>ו שַׁבָּת	2
[ב]עֶשְׂרִים	3
וּשְׁמוֹנֶה	4
בּו שַׁבָּת	5
עָלָיו אַחֵר	6

³⁷ Yadin, *The Temple Scroll*, v. 1, 122-131.

TRANSLATION

1. fir[st]
2. of] <it> is a sabbath.
3. [On the] twenty-
4. eighth
5. of it is a sabbath.
6. Upon it, after
7. the sabbath,
8. and the sec[ond day]

COMMENTS

L. 8 וְיִזְכֹּרְנוּ הַשָּׁנָה . Since only two letters in this line can be read with certainty, *הש*, the reading of the *PE*, *בְּיָזְכֹרְנוּ הַשָּׁנָה*, is still possible, but it has to be rejected on the basis of the content. The whole text is a record of sabbaths and festivals in a single year in which the Festival of Oil should only appear once but not twice. The festival is already found at 1 ii 5-6 so it is not possible that the name of the festival appears again in this line. The restoration suggested in *DJD 10* is adopted here. Although it cannot be confirmed by the extant writing, it does make better sense with the content.

Frg. 2 iii

בּו שבת	1
בעשתי עשר	2
בו שבת	3
בשמונה	4
עשר בו שבת	5
בעשרים	6
וחמשה	7

בו שבת	8
בשנים	9
בחם[י]ש[י]	10
[ש]ב[ת]	11

NOTES ON READINGS

L. 10 [י]ש[י]חם. The word is reconstructed in the *PE* as בַּחֹדֶשׁ. The third letter of the line, although it has only the top and the right hand side left, is certainly not a 1 but is most probably a final ם, which the scribe routinely wrote for the ם in the medial position.

TRANSLATION

1. of [it is a sabbath.]
2. On the el[eventh]
3. of it is a sabbath.
4. On the eight-
5. eenth of it is a sabbath.
6. On the twenty-
7. fifth
8. of it is a sabbath.
9. On the second
10. of the fif[th] (month)
11. is a [sa]bb[ath.]

COMMENTS

L. 10-11 [י]ש[י]חם [י]ש[י]ב[ת]. In the *PE* an additional line 12 is added and together the three lines (עשר₁₂ [י]ש[י]חם₁₁ בַּחֹדֶשׁ₁₀) render “in the eleventh month”. However, the reading of the word [י]ש[י]חם in line 10 proves this rendering to be wrong (cf. the above note). The *PE*’s erroneous reading is adopted by Eisenman and

Wise who, based on this rendering, reconstruct all three columns of this fragment as for the eighth to the eleventh month of the year.³⁸

³⁸ Eisenman and Wise, *The Dead Sea Scrolls Uncovered*, 189.

4Q328. 4QCalendrical Doc F^a (Mishmarot F^a)

(PLATES XXI)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 92; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 320; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 550-551; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 319-325; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 702-703.

Fragments

Only one fragment of this manuscript is preserved. It contains the top part of a column with the first six lines. The number of recognisable characters on it is eighty-three.

Palaeography

This manuscript was likely to have been penned by a formal hand of the early Herodian time, ca. 30-1 BCE.³⁹

Mus. Inv. 693
PAM 41.701, 42.331, 43.339

Frg. 1

top margin

יִשְׁבְּ] אֵב בִּשְׁשִׁית הַפְּצִץ אֱלֹהִי רִשִּׁי הַשָּׁנִים	1
[בִּשְׁנָה]הָרִאשׁוֹנָה גִּמּוּל אֱלֹהִים]יב[מוֹעֵז]ה[	2
[חֹפֶה ב]שְׁנִית יִדְעִיה בִּלְגָה ש[עו]רִים ח[זיר]	3
[בשלישית] מִי[מִין] { } פתחיה אב]יה יכין	4

³⁹ Compare with the archetype listed by Cross in "Jewish Scripts", Figure 2, line 4.

[ברביעית שכניה ד] ליה יקים יוי[ריב בחמישית]	5
[ישבאב חרם אמר] מלכיה בש[שית הפציץ הקוץ]	6

NOTES ON READINGS

L. 4 {ה...}. It is an erasure of about four to five letters. The editors of the *SE* read the erased word as {אביה}. With only the last letter scarcely seen as a ה their reading cannot be confirmed.

TRANSLATION

1. [Jushebe]ab; in the sixth, Happizzez. These are the leaders of the years.
2. [In] the first [year]: Gamul, Eliash[ib], Maaziah,
3. [Huppah. In] the second: Jedaiah, Bilgah, S[eo]rim, He[zir.]
4. [In the third:] Mija[min], {...h} Pethahiah, Abi[jah, Jachin.]
5. [In the fourth: Shecaniah, De]laiah, Jakim, Jehoi[arib. In the fifth:]
6. [Jushebeab, Harim, Immer,] Malchijah. In the six[th: Happizzez, Hakkoz,]

COMMENTS

L.1 [ישב]אב. The *PE* reconstructs the beginning of the line as [בחמישית ישב]אב. According to what is recorded in the fragment no doubt the word *בחמישית* should come in front of *ישבאב*, but judging from the space available for the missing words at the beginning of line 1 it is more likely that the word is not in this line but rather is the last word of the preceding column.

4Q329. 4QCalendrical Doc F^b (Mishmarot F^b)

(PLATES XXIII)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 93; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 321; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 550-551; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 325-331; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 702-705.

Fragments

Three fragments of this manuscript have been found. Two of them can be identified with a column, although they are not physically connected to one another, thus they are regarded as parts of fragment 1. The first piece of this fragment contains four lines and part of the right margin. Between the third and fourth lines is a superlinear word. The number of characters identified including the superlinear word is thirty. The other piece of this fragment is about the same size and also has four lines but without any margin. It has approximately twenty-seven recognisable characters. Fragment 2 has the first three lines of a column together with a possible top margin, and the number of characters identified is twenty-nine.

Palaeography

The handwriting of this manuscript is very similar to that of 4Q328, although they can still be distinguished as having been copied by different hands. Thus 4Q329 is likely to be of the same type of script as 4Q328, that is an early Herodian formal script of the period ca. 30-1 BCE.

Mus. Inv. 710

PAM 41.703, 42.332, 43.334

שעורים [חזיר בשנית מימין פתחיה עביה יכין בשנה]	1
השלישית [שכניה דליה יק]ם יורִיב [ברביעית ישבאב]	2
[ח]רִים אמֶר [מלכיה בחמישית] הפצץ הקו[ן יחזקאל ישוע בששית]	3
[ה]שָׁנָה <הרישונ[ה]> בחו[רש דליה מו]עֲזִיָּה יורִיב יִדְעִי בשני חרים]	4
[שעורים מלכיה מימין הקוץ ב]שלישי אֶ[ביה ישוע שכניה]	5

NOTES ON READINGS

L. 5 אֶ[ביה]. Only two tiny dots at the bottom of the first letter are left, which could be the remainder of several possible letters, such as ה, ח, or א. Based on the reading of this letter Snyder refutes the *PE*'s arrangement of the priestly names in this section.⁴⁰ He affirms that this is an א instead of a ה, and argues that the priestly name coming after בשלישי is Abijah instead of Hakkoz. Snyder's proposal may make better sense with the text but the remnant of this letter does not provide much evidence to support his argument.

TRANSLATION

1. Seorim, [Hezir in the second; Mijamin, Pethahiah, Abijah, Jachin in the]
2. third [year; Shecaniah, Delaiah, Jaki]m, Jehoiarib [in the fourth; Jushebeab,]
3. [H]arim, Immer, [Malchijah in the fifth;] Happizzez, Hakko[z, Jehezkel, Jeshua in the sixth.]
4. [The] <first> year. In the mon[th: Delaiah, Ma]aziah, Jehoiarib, J[edaiah. In the second (month): Harim,]
5. [Seorim, Malchijah, Mijamin, Hakkoz. In the] third (month): A[bijah, Jeshua, Shecaniah.]

COMMENTS

L. 4-5. There are two proposals for the restoration of the priestly names in these lines.

⁴⁰ Snyder, "Mishmarot Calendars", 329.

Proposal 1 (*PE* and *SE*)

First month -	Gamul, Delaiah, Maaziah, Jehoiarib
Second month -	Jedaiah, Harim, Seorim, Malchijah, Mijamin
Third month -	Hakkoz, Abijah, Jeshua, Shecaniah

Proposal 2 (Snyder⁴¹ and Wise, Abegg, and Cook⁴²)

First month -	Delaiah, Maaziah, Jehoiarib, Jedaiah
Second month -	Harim, Seorim, Malchijah, Mijamin, Hakkoz
Third month -	Abijah, Jeshua, Shecaniah

Proposal two is adopted here because it makes better sense with the interpretation of the text. The section is without doubt an enumeration of the weekly priestly services on a monthly basis, and for such a weekly enumeration the most likely event of recounting is obviously the sabbath. Although Gamul is the course serving on the New Year's Day of the first year, the first sabbath does not fall on Gamul but Delaiah. Proposal two is a restoration based on that the text is recording the list of sabbaths in each month according to the priestly courses.

Frg. 2

top margin?

יְדַעִיָּה חֲרִים שְׁעוֹנִיָּה	1
אֶלִישִׁיב יָקִים חוּפָּא	2
יְחִזְקֵאל יִכְנִין	3

TRANSLATION

1.] Jedaiah, Harim, Seo[rin
2. E]liashib, Jakim, Huppah[
3. Jehez]kel, Ja[chin

⁴¹ Snyder, "Mishmarot Calendars", 326.

⁴² Wise, Abegg, and Cook, *A New Translation*, 321.

4Q329a. 4QCalendrical Doc G (Mishmarot G)

(PLATES XXIII)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 94; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 321-322; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 551-552; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 332-336; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 704-705.

Fragments

This manuscript has only one fragment which contains the lower left corner of a column. This might actually be the left bottom corner of the leaf of leather because the scribe after finishing the bottom line continued to write on the left margin by turning the leaf around 90 degrees anti-clockwise. Other than the vertical line the fragment shows another five lines. The total number of characters on it is forty-nine.

Palaeography

The hand of this manuscript is likely to be in the style of the late Hasmonean semicursive script, ca. 50-25 BCE.⁴³

Mus. Inv. 710

PAM 41.774, 42.333, 43.334

Frg. 1

הַשָּׁנָה הָרִישוֹנָה מוֹעֲדִיהָ בְּשָׁלֹשָׁה בְּ[שֶׁבֶת]	1
מִעוֹזִיָּה הַפֶּסַח בְּשָׁנִית מִ[עֲדָ]יָה בְּ[שֶׁ]לֹּשָׁה	2
בְּשַׁעוּרִים הַפֶּסַח בְּשָׁלֹשִׁית מִעֲדִיָּה בְּשָׁלֹשָׁה	3

⁴³ Similar to the archetype set out by Cross in "Jewish Scripts", 149, Figure 4, line 4.

[באביה הפס] ח' ברבעית מעדיה	4
[בשלשה ביקים הפ] סח החמשית מעדיה	5
בשלשה באמ'ר הפסח	6

bottom margin

NOTES ON READINGS

L. 1 [השנה הרישונה מועדיה בשלשה]. Reference for the restoration of this line is made to the other lines in this fragment and the festive section in 4Q320 4 iii-vi.

L. 6 בשלשה באמ'ר. The line is written vertically from bottom to top on the left margin. It is misplaced in the *PE* to the front of line 5, but its content shows that it should be the continuation of line 5.

TRANSLATION

1. [The first year, its festivals (begin) on the third of the] week of
2. [Maaziah (with) the Passover. In the secon]d (year), its fe[stiva]ls (begin) [on the th]ird (day)
3. [of Seorim (with) the Passover. In the thir]d (year), its festivals (begin) on the third (day)
4. [of Abijah (with) the Passov]er. In the fourth (year), its festivals (begin)
5. [on the third (day) of Jakim (with) the Pass]over. In the fifth (year), its festivals (begin)
6. on the third (day) of Imm[er (with) the Passover.]

COMMENTS

L. 4 [באביה]. The beginning of the line is restored in the *PE* as [בשבת אביה]. Although the *PE*'s restoration makes the overall length of this line closer to the others, the word *שבת* is unlikely to be in the original text. The word is found with the first entry in line 1. However, since it is common for the Calendrical Documents to give the initial entries more elaborated descriptions, this should not be taken as the standard pattern for the other entries. Line 6 provides clear evidence that the word is

omitted in that entry, and the spaces of the lacunas in line 3 and 4 also do not allow the word to be restored.

4Q330. 4QCalendrical Doc H (Mishmarot H)

(PLATES XXIII)

Bibliography: B. Z. Wacholder and M. G. Abegg, *A Preliminary Edition of the Unpublished Dead Sea Scrolls: The Hebrew and Aramaic Texts from Cave Four, Fascicle I* (Washington, D.C.: Biblical Archaeology Society, 1991) 95; M. O. Wise, M. G. Abegg Jr., and E. M. Cook, *The Dead Sea Scrolls: A New Translation* (London: HarperCollins, 1996) 322; F. García Martínez, "Calendarios en Qumran," *Estudios Biblicos* 54 (1996) 552; G. Snyder Jr., "Mishmarot Calendars From Qumran Cave 4: Congruence and Divergence" (PhD Thesis, Hebrew Union College, 1997) 336-341; F. García Martínez and E. J. C. Tigchelaar, *The Dead Sea Scrolls Study Edition, Volume Two, 4Q274-11Q31* (Leiden: Brill, 1998) 704-705.

Fragments

This manuscript has three fragments and they are all very small. Fragment 1, the largest of them all, has two columns, but the first column has only one single character left. The second column has three lines preserved together with a few superlinear words above the third line. This fragment has forty-two identifiable characters. Fragment 2 contains four lines but has only thirteen characters. Fragment 3 is even smaller; it has only one line of eight characters.

Palaeography

The limited sample size of letters makes the classification of this manuscript hand difficult. With some speculation it may be assigned to the formal hand of the Herodian time.⁴⁴

Mus. Inv. 710
PAM 41.703, 42.333, 43.334

Frg. 1

מימין באחד בחוד {ש} הר[אשון] 1

⁴⁴ Compare to the exemplars in Cross "Jewish Scripts", 138-139, Figure 2, lines 5 and 6.

בשבוע ששי ש נה] הרביעית שכניה באחד בחודש הראשון	2
שנה שנית <בשנה החמישית> ישבאב באחד בחודש הראשון	3
]ל[	4

NOTES ON READINGS

L. 1 ש{•}. בחוד. The ש is separated from the ד by an erasure of a letter's width.

L. 2 הרביעית שכניה באחד בחודש הראשון. The restoration proposed for this line and the one below is based on the preserved wordings in line 1 and 3.

L.3 ישבאב. The word is misread in the *PE* as ישכאב.

TRANSLATION

1. Mijamin on the first of the f[irst] month [
2. in the sixth week. Year [fourth, Shecaniah on the first of the first month.
3. Year second <In the year f[ifth]>, Jushebeab on [the first of the first month.
4.]/[

Frg. 2

]••[	1
באחד בחודש הראשון	2
ין ש[מ]מה	3
בחודש הראשון	4

NOTES ON READINGS

L. 3 ין. The restoration in the *PE* for this word is מימין. With only the last two letters remaining and without the support of the content the restoration of the priestly name is unwarranted.

TRANSLATION

1.]••[
2. on] the first of the [first] mont[h

3.]*ɤn* re[le]ase
4. [on the] firs[t mon]th[

Frg. 3

ב[חודש הראשון]

2

TRANSLATION

2. [on] the firs[t] month

CHAPTER 3

STRUCTURE OF THE QUMRAN CALENDRICAL DOCUMENTS' CALENDAR

Since the 1957 preliminary report by Milik on some of the calendrically related manuscripts¹ the structure of the Qumran calendar no longer seems to be a question for researchers. According to Milik's report this is a calendar in which "l'année a 364 jours, et se compose de 12 mois de 30 jours avec 4 jours intercalaires par an, un par trimestre. Le Nouvel An commence toujours le mercredi et les dates des fêtes sont rigoureusement fixés, chaque quantième du mois tombant toujours le même jour de la semaine."² Despite Milik's cautious remark that his report statement was only "encore provisoire", the assumed structure was taken for granted as the calendrical base for all the calendrically related documents found at Qumran.

However, as more Qumran material is released and further information is gathered, the focus of Qumran calendrical studies in the last decade has gradually shifted from unity to diversity. In reviewing the calendrical aspect of the Dead Sea Scrolls in a commemorative work marking the fiftieth anniversary of their discovery, Glessmer summarizes this shift:

In the discussions of the last 50 years a shift is clearly apparent. When the Scrolls were first discovered the view was that their calendar present [sic] specific potential for conflicts. Opposition of one calendar against another suggested *uniformity* of concept for both sides. But in light of the manifold details now available to us, it has become increasingly evident that these ancient texts witness not to monolithic, static phenomena, but to diverse growth and development.³

¹ Milik, "Le travail," 24-26.

² Milik, "Le travail, 24-25.

³ Glessmer, "Calendars", 233.

With this in mind, Glessmer titles the review “*Calendars* in the Qumran Scrolls” [italics mine], and suggests that when addressing the calendrical concept at Qumran a more comprehensive heading “364-Day Calendar Traditions - 364-DCT” should be used to replace the oft-used but inappropriate term “solar-calendar”. However, the trend of searching for divergence is in general more focused on other calendrical aspects, such as the different festive traditions or the attitudes towards lunar reckoning, rather than on the basic structure of the calendar. Other than a few dissenting voices raising the question of possible differences⁴ the generally assumed structure has been by and large accepted by all. Even the release of the Qumran Cave IV material in the early nineties failed to draw the interest of the researchers to review this seemingly settled aspect of the calendar.

Perhaps the work of the early editors is convincing enough in this respect, but the recently released material poses the question for those who study the Qumran calendar: What evidence does it provide for understanding the structure of its calendar? Since this important source of material is now available for our perusal, it is now time to attempt to reconfirm this understanding with hard evidence. The purpose of this chapter is to provide a comprehensive investigation into the structure of the calendar underlying the Calendrical Documents based on the factual evidence embedded in their extant fragments.

The investigation will be conducted on three interrelated units of the calendar, namely the year, the week, and the month. The question on the year is how many days do the Calendrical Documents reckon in a year. As Glessmer’s proposed categorical heading (i.e. 364-DCT) shows, taking the year as having only 364 days in a year is a special enough criterion to justify having such calendars classified in a category of their own. However, throughout the history of calendar-making this number has never

⁴ Callaway questions the monthly structure among the texts of 364-day tradition, Callaway, “The 364-Day Calendar”, 24. Snyder proposes a different possible arrangement in the monthly structure for a 364-day year, “Mishmarot Calendars”, 39, and casts doubt on the theory that *Jubilees* begins its year on the fourth day of the week, “Mishmarot Calendars”, 42. Beckwith in “The Essene Calendar”, 466, n. 18, also raises the possibility that “the author of *Jubilees* is thinking of the Essene year as commencing on the Sunday of creation-week, not the Wednesday, the first day not the fourth.”

been a popular choice for the year length. So is there sufficient evidence in the Qumran Calendrical Documents to confirm their compliance to such a peculiar reckoning, or is there proof of other ways of counting? Following the question on the year is a related enquiry about the cycle of weeks, that is to search for the matching between the yearly days and the weekdays. For a calendar taking the number of days in a year as 364, which is an exact multiple of seven, each of its days will match with a particular weekday year by year. In like manner, another way to put the question is to ask on which weekday does the New Year's Day fall in every year. Milik believed that the Qumran calendar had the New Year's Day on a Wednesday, the fourth day of the week. What evidence is there in the Calendrical Documents to support this claim? Or do they support other possible ways of reckoning? The third area to be considered is the arrangement of the months. After the number of days in a year is fixed it is a logical thing to look for how these days are sub-divided into months. Milik's idea on the Qumran calendar is that its days are arranged into twelve months of thirty days together with four extra days, one in each quarter of the year. Is this proposal substantiated by the Calendrical Documents? In addition, where are these four extra days placed in the quarters?

In asking questions on different aspects of the structure of the calendar, the investigation will proceed in two different lines. The Calendrical Documents will be divided into two groups according to a special feature which can only be found among them, that is the employment of the priestly courses as calendrical units. The groupings will be classified as "Priestly-Courses Documents" and "Non-Priestly-Courses Documents" depending on the presence and absence of the feature. There is nothing special about the priestly courses on their own. The practice of dividing the priests into different courses to take turn in serving their appointed duty can be traced far back into the history of the ancient Israelites which is well documented in the Hebrew Bible and other Jewish classical sources. However, using them as a time reckoning unit is unique to the Qumran Scrolls. Integrating the priestly courses into the calendrical system is such a special feature that, one could argue, documents bearing this feature are more than likely based on the same calendar, at least as far as its structure is concerned. After separating the documents accordingly, the two

groups will be dealt with differently in studying their underlying calendar. For the Priestly-Courses Documents their special feature allows them to be studied as a whole, and their evidence will be drawn together to confirm the structure of their calendar. For the Non-Priestly-Courses Documents the absence of a conforming feature means that each document has to be looked at separately.

CALENDRIAL DOCUMENTS WITH THE PRIESTLY-COURSES FEATURE

Priestly Courses in the Classical Sources

Dividing the priestly service into different courses is not a creation of the Qumran Scrolls. It is well attested in the Hebrew Bible and other Jewish classical literature. In 1 Chr 24 the action of organising the priests into divisions is ascribed to king David, who “organised them according to the appointed duties in their service.” (24:3)⁵ The descendants of the two sons of Aaron were divided into twenty-four heads of families, sixteen from Eleazar and eight from Ithamar. Then the twenty-four families drew lots to decide the order of their service, and the result of the lots was “their appointed duty in their service to enter the house of the LORD according to the procedure established for them by their ancestor Aaron, as the LORD God of Israel had commanded him.” (24:19) However, the Chronicler’s list of priestly families is not the only one in the Hebrew Bible. Among the returnees from the Exile recorded in Ezra 2:36-39 and Neh 7:39-41 only four priestly clans are listed and one of these priestly names (i.e. Pashhur) is not in the Chronicler’s list. In Nehemiah the leaders of the priests are listed again in another three passages (Neh 10:1-8, 12:1-7, and 12:12-21). These lists have either twenty-one or twenty-two names, and they differ from one another, and also most of their names are different from those in Chronicles.

⁵ Unless otherwise specified all biblical quotations are based on *The New Oxford Annotated Bible: New Revised Standard Version* (New York: Oxford University Press, 1994).

Priestly Names in the Biblical Records

11 Chr 24:7-18	Ezra 2:36-39 = Neh 7:39-42	Neh 10:1-8	Neh 12:1-7	Neh 12:12-21
Jehoiarib (1)	Jedaiah	Zedekiah	Seraiah	Seraiah
Jedaiah (2)	Immer	Seraiah	Jeremiah	Jeremiah
Harim (3)	Pashhur	Azariah	Ezra	Ezra
Seorim (4)	Harim	Jeremiah	Amariah	Amariah
Malchijah (5)		Pashhur	Malluch	Malluchi
Mijamin (6)		Amariah	Hattush	
Hakkoz (7)		Malchijah	Shecaniah	Shebaniah
Abijah (8)		Hattush	Rehum	Harim
Jeshua (9)		Shebaniah	Meremoth	Meraioth
Shecaniah (10)		Malluch	Iddo	Iddo
Eliashib (11)		Harim	Ginnethoi	Ginnethon
Jakim (12)		Meremoth	Abijah	Abijah
Huppah (13)		Obadiah	Mijamin	Miniamin
Jeshebeab (14)		Daniel	Maadiah	Moadiah
Bilgah (15)		Ginnethon	Bilgah	Bilgah
Immer (16)		Baruch	Shemaiah	Shemaiah
Hezir (17)		Meshullam	Joiarib	Joiarib
Happizzez (18)		Abijah	Jedaiah	Jedaiah
Pethahiah (19)		Mijamin	Sallu	Sallai
Jehezkel (20)		Maaziah	Amok	Amok
Jachin (21)		Bilgai	Hilkiah	Hilkiah
Gamul (22)		Shemaiah	Jedaiah	Jedaiah
Delaiah (23)				
Maaziah (24)				

Tabulating the lists of priestly leaders recorded in the various books of the Hebrew Bible reveals that the division of priestly families was not a fixed arrangement from the outset but an ongoing process of changes and development. When exactly the order of the twenty-four priestly courses was finally consolidated is not certain, but it is likely to have happened sometime after the return from the Exile.⁶

The rabbinic literature also reflects that the number of the priestly courses did change over time but there are different views on this development. The Mishnah as

⁶ By analysing the literary layers of 1 Chr 23-27 Williamson assigns the development of the 24 priestly courses to the closing year of the Persian period. See H. G. M. Williamson, "The Origins of the Twenty-Four Priestly Courses," in J. A. Emerton (ed.), *Studies in the Historical Books of the Old Testament* (Supplements to Vetus Testamentum 30; Leiden: Brill, 1979) 251-268.

the base text of the rabbinic literature provides only a very brief information on the matter: “the early prophets made the rule of twenty-four watches”. (*m. Ta'an. 4:2 D*) However, when commenting on this simple statement, the rabbis provided various versions of how this number was reached.

- Moses set up eight watches for the priesthood, then they were further divided into twenty-four by David and Samuel. (*t. Ta'an. 3:2 A-B; b. Ta'an. 27a*)
- Moses instituted eight watches, and Samuel increased them to sixteen, then David made them twenty-four. (*b. Ta'an. 27a*)
- Moses instituted sixteen, which were then increased to twenty-four. (*b. Ta'an. 27a*)
- Moses set up eight watches, then David and Samuel added another eight, which was later increased to twenty-four. (*y. Ta'an. 4:2.67*)

Diverse as these records are, they all agree on three points. They all trace back the establishment of the priestly courses to the time of Moses, point to a growth in the number of courses with David and Samuel, and agree on the final number of the courses as twenty-four.

Rotation of the Priestly Courses

Exactly when the twenty-four priestly courses pattern was instituted into the cultic practice of the Jerusalem Temple is not certain, but Josephus' report in the *Jewish Antiquities* - “this apportionment [of the priestly courses] has lasted down to this day”⁷ - allows us to see that it was probably practised in the Temple as late as its destruction. In order to understand how the priestly courses can be integrated into the calendar as a time reckoning unit it is necessary to know how the priestly roster worked in the Temple.

A hint on how the priestly courses rotated their service is found in 2 Chronicles, “priests and Levites, who come on duty on the sabbath, shall be gatekeepers” (23:4) and “who were to come on duty on the sabbath, with those who

⁷ *Ant. 7 §367*

were to go off duty on the sabbath” (23:8). These verses reveal that at the time of Jehoiada, the priest who saved and restored Judah king Joash, the priests and the Levites came on and off their duty on the sabbath. More explicit statement on this practice is found with Josephus. While basically repeating what is said in 1 Chr 24, Josephus provided further information about the twenty-four priestly courses by stating that “he [David] further arranged that one family should minister to God each week from Sabbath to Sabbath.”⁸ Similar information can also be found in the Mishnah. In *m. Tamid* 5:1 D it is stated: “And on the Sabbath they add a blessing for the outgoing priestly watch.” From these records an aspect of the practice of the priestly courses is revealed - each priestly course served for a week’s time in the Temple from sabbath to sabbath.

Regarding the time of the day for the changeover of duty to take place, Josephus’ record is most precise. The priestly tribes “officiate by rotation for a fixed period of days; when the term of one party ends, others come to offer the sacrifices in their place, and assembling *at the mid-day* in the temple, take over from the outgoing ministers the keys of the building.”⁹ [italics mine] In the rabbinic literature the time for the changeover is also conveyed but in a more vague manner. “The outgoing priestly watch offers the morning’s daily whole-offering and the Show Bread. The incoming priestly watch then offers the evening’s daily whole-offering and the Show Bread.”¹⁰ The passage suggests that the change of duty took place sometime between the morning and the evening offerings, a practice in accord with Josephus’ record. Together these records show that on the sabbath days the outgoing course finished the required services in the morning then handed over the duty to the incoming course at the middle of the day who then took over the rest of the day’s sacrificial works.

Further to their routine weekly services, all the priests, the rabbinic literature discloses, also had to share the sacrificial duty of the feasts three times a year. “Three times a year all the priestly watches shared equally in the offerings of the feasts and in

⁸ *Ant.* 7 §366

⁹ *Ag. Ap.* 2 §108

¹⁰ *t. Sukk.* 4:24-25

the division of the Show Bread.”¹¹ However, this sharing of work on the feast days seems to only apply to the additional offerings of the feasts but not to the routine daily work of the weekly duty. For it is stated in the subsequent regulations of the Mishnah: “The priestly watch whose time of service is scheduled [for that week] is the one which offers the daily whole offerings, the offerings brought by reason of vows and freewill offerings, and the other public offerings.”¹² During the festivals although all the twenty-four courses were present in the Temple, only one was regarded as being the course on duty for that week. Under this system all the twenty-four priestly families were required to follow a regular weekly roster from sabbath to sabbath in order to provide uninterrupted service in the Temple week by week and year by year.

Priestly Courses as a Calendrical Feature

The review about the roster of the priestly courses in the Jewish classical sources on one hand produces a general picture of how it was developed and practised in ancient times, but on the other hand it also shows that the priestly courses roster was never regarded as a time reckoning tool in Jewish history. The sources agree that the priestly courses roster is based on a fixed time period - the sabbath cycle - but they do not give it a role as a time reckoning device and never operate it alongside the other time units, such as the days and months. Arranging the priests into divisions to take turn to serve in the Temple may have a long history from as early as the First Temple to the destruction of the Second Temple but the records show that it was operated independently of the calendrical system.

The seven-day cycle of the weeks is a rather extra-ordinary and unique calendrical unit reckoned in ancient times mainly by the Jews. While the other common calendrical units, that is the day, the month, and the year, are all closely related to the cycles of nature, the week is schematic and artificial. Therefore the integration of the weekly cycle with the other calendrical units is never easy, if not

¹¹ *m. Sukk.* 5:7 A

¹² *m. Sukk.* 5:7 C

impossible. How the weekly cycle is separated from the calendar in the rabbinic literature is telling. The rabbis were meticulous about the arrangement of their calendar and they greatly honoured the weekly sabbath, but they never attempted to integrate them together. In the rabbinic literature although both the calendar and the sabbath were reckoned and honoured, they were just two independent systems operating side by side but never interacted. In this respect, the discovery of an integration between the two in the Qumran Calendrical Documents is indeed novel. The enumerating of the dates of various events according to the priestly courses forms an unique feature in these documents. In return this unique feature also evinces the identity of the calendar underlying these documents for the amalgamation would exert great demand on the structure of the integrated calendar. It is under this consideration that the Calendrical Documents bearing this characteristic feature are gathered together to form a collective group - Priestly-Courses Documents - for the following investigation of their calendrical structure.

Calendrical Documents with the Priestly-Courses Feature

The original editors of the Qumran Scrolls have assigned the title “Mishmarot” to a set of sixteen manuscripts.¹³

4Q320	Mishmarot A	4Q324a	Mishmarot C ^d	4Q328	Mishmarot F ^a
4Q321	Mishmarot B ^a	4Q324b	Mishmarot C ^e	4Q329	Mishmarot F ^b
4Q321a	Mishmarot B ^b	4Q324c	Mishmarot C ^f	4Q329a	Mishmarot G
4Q322	Mishmarot C ^a	4Q325	Mishmarot D	4Q330	Mishmarot H
4Q323	Mishmarot C ^b	4Q326	Mishmarot E ^a		
4Q324	Mishmarot C ^c	4Q327	Mishmarot E ^b		

¹³ Although the group is now more common known with the title “Calendrical Document”, the original name “Mishmarot” has not been totally superseded.

They all bear the same title, but not all of them demonstrate the characteristic feature of employing the priestly courses in a calendrical manner. Thus the division cannot simply be done according to the titles given.

Among the sixteen “Mishmarot” manuscripts eleven of them have no difficulty in being confirmed as containing the Priestly-Courses feature for they have in their extant fragments at least a couple of concrete readings of some of the twenty-four priestly names. These manuscripts are 4Q320, 4Q321, 4Q321a, 4Q322, 4Q323, 4Q324, 4Q324a, 4Q325, 4Q328, 4Q329, 4Q330.

Two manuscripts, 4Q326 and 4Q327, show no sign of this Priestly-Courses feature. Not only are the priestly names not found in their fragments, but also the restoration of their calendrical entries does not allow the names to be inserted either. In 4Q327 several entries are found intact which prove the absence of the priestly names in the document’s repetitive formula. In 4Q326 no intact entry survives but parts of the extant entries provide the necessary information for the restoration of the document’s standard formula. The composite formula suggests that the priestly names form no part of this text.

The other three manuscripts, 4Q324c, 4Q324b, and 4Q329a, all have at least one priestly name restored in their texts by the editors. However, it does not mean that they can all have the presence of the Priestly-Courses feature confirmed. In 4Q324b יחזקאל is restored in fragment 2. The word has only the last two letters clearly read. The last third letter is damaged and cannot be identified as any particular letter. Thus restoring the word as the priestly name is rather based upon an assumption of the presence of the priestly name than a confirmed reading. Moreover, the wording preserved in fragment 1 shows that the manuscript contains material other than calendrical entries, which discounts the likelihood of the word in fragment 2 being calendrically related. 4Q324c has two names restored, אליהו³שיב in fragment 5 and בל⁴גה in fragment 14. Similar to the case in 4Q324b these readings are not certain. Despite the fragmentary state of the manuscript the large number of tiny fragments allow a glimpse of the standard formula used for its calendrical entries. And the reconstructed standard formula does not have a place for the priestly names. Thus the Priestly-Courses feature is not likely to be found in 4Q324c.

In 4Q329a the reading of the priestly name is even more remote. In 1:6 it reads: בְּאֵמָּר. Other than the firm reading of the preposition, only the first letter of the suggested name can be partially seen. Although the reading of the name cannot be confirmed, the restoring of the priestly name at this place is almost certain. In the single fragment of this manuscript all the words recovered suggest that this text contains standard formulaic calendrical entries only. As represented by the repeatedly occurring word בשלשה, the weekday forms part of the standard formula, and it is most likely that this weekday is in reference with the priests' weekly services. Moreover, the resemblance of this text with some lines in 4Q320 4 iii-vi provides further confirmation of the formulaic restoration. Thus even without a completely clear reading of the priestly names in this manuscript the presence of the Priestly-Courses feature is certain. As a result, of the sixteen "Mishmarot" manuscripts twelve of them are confirmed as having the Priestly-Courses feature, and four are not.

Other than the "Mishmarot" manuscripts there are two Calendrical Documents, 4Q317 and 4Q319, with titles of their own. Just because they are under different names does not necessarily mean that they have nothing to do with the priestly courses. 4Q319 is known as 4QOtot and is named after the most prominent feature of the text, the recurrence of the word "sign". However, this central theme is recounted against the background of the priestly courses. Although only two priestly names appear in the enumeration of the signs, that the priestly roster forms the framework of the counting is indisputable. Equally obvious is that other than the main *Otot*-section, the manuscript also has a few shorter sections which make use of the priestly names in recounting other calendrical events. Therefore 4Q319 is definitely a Priestly-Courses Document although it is not named as one.

In contrast to 4Q319, the Priestly-Courses feature is not found in 4Q317 because the priestly names are not there in its fragments at all. The manuscript is called 4QPhases of Moon and is named after its day by day recounting of the lunar phase change. When the moon is in its waning or waxing stage the recounting formula only records the day of the month and the corresponding amount of moonlight but not the weekday or the priestly course in service. When it comes to the moon's transition phases, that is the full moon and the dark moon, the entries mention the weekday

along with the monthly day and the amount of moonlight. All the surviving incidences of this weekday record show that only the day of the week is stated as “on *a certain day* of the week” (ב... לַשַּׁבָּת)¹⁴ without referring to the priestly courses. All these lead to the conclusion that the Priestly-Courses feature is not present in 4Q317.

Summarising the above review, the Calendrical Documents can now be separated into two groups according to the presence and absence of the Priestly-Courses feature.

- Priestly-Courses Documents (13): 4Q319, 4Q320, 4Q321, 4Q321a, 4Q322, 4Q323, 4Q324, 4Q324a, 4Q325, 4Q328, 4Q329, 4Q329a, 4Q330
- Non-Priestly-Courses Documents (5): 4Q317, 4Q324b, 4Q324c, 4Q326, 4Q327

Priestly Roster in the Priestly-Courses Documents

Jewish classical sources disclose that the service of the priestly courses was arranged on a weekly basis with the changing of shift at the mid-day of the sabbath. Before looking at the structure of the calendar of the Priestly-Courses Documents the traditional arrangement will be reviewed to see whether these documents agree with it, or whether they have their own pattern.

Some Priestly-Courses Documents (4Q323, 324, and 324a) provide lists of dates for the priestly courses entering to their duty, but they are all very fragmentary with not much of the priestly entering dates and the order of the priestly courses surviving. However, explicit information on the priestly courses arrangement can be found in another manuscript, 4Q325, which lists the sabbaths one by one with a standard format: “On *a certain day* of it is the sabbath of *a certain priestly course*” (ב... בַּ שַׁבָּת ...). Five entries of such record survive in 4Q325 1:3-6:

- On the second of it is the sabbath of Harim.
- On the ninth of it is the sabbath of [Seorim].
- On the sixteenth of it is the sabbath of Malchijah.
- On the twenty-third of it is the [sabbath] of Mijamin.

¹⁴ 4Q317 1:10, 2:9, and 4:8.

- On the thirtieth of it is the sabbath of Hakkoz.

These entries record all the sabbaths of a particular month. They do not only provide the days of the month for the sabbaths, but also name each of the sabbaths after the relevant priestly course. The names found in these lines are the same as the third to the seventh of the priestly leaders in 1 Chr 24, and they are in exactly the same order. Thus these surviving entries of 4Q325 show that each sabbath is assigned to one priestly course, which does agree with the Jewish classical literature in reckoning the length of each watch to a week running from sabbath to sabbath.

This “naming-the-weeks-after-the-priestly-courses” method leads to a question about the designation of the sabbaths: as there are two courses serving on these days, one incoming and the other retiring, after which one should the sabbaths be named? For the other days of the week there is no problem with the assignment for they have only one priestly course on duty. However, on the sabbaths the naming is not that easy. Whether the sabbath should be named after the incoming or the retiring course is something that was decided by the authors, but which also needs to be discerned by their readers.

Data extracted from one of the documents are sufficient to show how this problem is tackled in the Priestly-Courses Documents. Fragment 1 of 4Q320 is a chart of the recurrences of an event which takes place every twenty-nine or thirty days. The dates of the event recorded in 1 ii 5-8 according to the priestly courses are listed in the table below with their corresponding intervals calculated:

Line	Priestly-Courses Date	Order of the Course in 1 Chr 24	Separating Interval	in days
5	day 2 of Malchijah	5		
6	day 4 Jeshua	9	4 courses and 2 days	30
7	day 5 Huppah	13	4 courses and 1 days	29
8	sabbath of Happizzez (if entering)	18	4 courses and 2 days	30
8	sabbath of Happizzez (if leaving)	18	5 courses and 2 days	37

If “sabbath of Happizzez” refers to the day when Happizzez first enters its week’s service, the interval separating this day and the last recurrence of the event would be

thirty days, as shown in the second last line of the table. However, if the phrase refers to the last day of the course's service, then the separating interval would be thirty-seven days, as shown in the last line of the table. A thirty-seven day separation violates the general rule of the text so this cannot be the correct interpretation. Hence these entries confirm that the text names the sabbath according to the entering course rather than that of the leaving one. Thus it can be concluded that the Priestly-Courses Documents count the service days of a priestly course starting with the sabbath. For example, if Delaiah is entering its service on the sabbath of the 4th of the first month, the days of that week would be reckoned in these documents as:

4/1	5/1	6/1	7/1	8/1	9/1	10/1
sabbath of	day one	day two	day three	day four	day five	day six
Delaiah	of Delaiah	of Delaiah	of Delaiah	of Delaiah	of Delaiah	of Delaiah

CALENDRIAL STRUCTURE OF THE PRIESTLY-COURSES DOCUMENTS

Having confirmed how the roster of the priestly courses is reckoned in the Priestly-Courses Documents, we can now look at the three areas concerning the structure of their calendar, namely the length of the year, the weekday of the New Year's Day, and the monthly structure.

Length of the Year

Although the idea of a year exists in almost every calendar, ancient or modern, there is no universal consensus on the reckoning of its length in terms of days. Nearly all the calendars get their idea of the year from the seasonal changes induced by the movement of the earth around the sun. Nevertheless this annual cycle is absorbed into the calendars in various ways. Some common examples of fixing the length of the year are:

- The 360-day ideal year in ancient Mesopotamia

The ideal year was used for recording commercial business and astronomical calculation in the Ancient Near East. By taking the year with only 360 days the

advantage of this reckoning is that its year is readily subdivided into twelve equal months of thirty days, which facilitates the recording of business transactions and provides a simple time-frame for scientific exploration. The 360-day year falls far short of the natural annual cycle but its simplicity and regularity attracted the devotion of the ancient scribes and the astronomers despite its short comings.

- The fixed 365-day year of the ancient Egyptian calendar

This fixed year is in close approximation to the solar cycle but is still approximately a quarter of a day short. The difference caused the Egyptian year to shift gradually around the natural cycle, and the ancient Egyptians reckoned that this drift completed a cycle of seasons every 1461 Egyptian years, which was known as the “Sothis” cycle.

- The varying 365- or 366-day year of the Julian calendar

By fixing the year with 365 days but extending it with an extra day to 366 days every four years, this achieves a good approximation of the natural cycle. This method of fixing the year in close approximation with the solar cycle and then adjusting it with the occasional addition or deletion of a day to bring it into exact alignment was adopted in principle throughout the whole Roman world in ancient times, and is still being widely used in the modern world.

- The year equating to 12- or 13-lunation of the lunisolar calendar

This was the most common form of calendar in the ancient world. Calendars based on this principle existed in almost every ancient civilisation. The basic idea of this form of calendar is to reckon time according to the lunar cycle, and then to count the year in close proximity with the complete number of lunations. With this method it can be said that the calendar has no fixed length of year. Its year varies between twelve or thirteen lunar months, and the month varies between twenty-nine to thirty days. So a year in this calendar can have somewhere around 353 to 355 days (twelve lunar cycles) or around 383 to 385 days (thirteen lunar cycles) depending on how many cycles are there in the year and how many of these cycles are full (thirty days) and how many of them are hollow (twenty-nine days).

That the year is reckoned as having 364 days is almost unheard of in calendrical design outside the Pseudepigrapha and the Qumran Scrolls.¹⁵ The reckoning is first discovered in the pseudepigraphal books, *Jubilees* and *1 Enoch*. Despite being peculiar it was so well attested in these books that scholars could not just dismiss it as textual corruption but had to accept that their authors had their own particular idea of year compared to that of other ancient calendar designers. Explicit statements on having a year with only 364 days can be found in both *Jubilees* and *1 Enoch*.

*Jubilees*¹⁶

(6:32) “And command thou the children of Israel that they observe the years according to this reckoning - three hundred and sixty-four days, and (these) will constitute a complete year”

(6:38) “for after thy death thy children will disturb (them), so that they will not make the year three hundred and sixty-four days only”

*1 Enoch*¹⁷

(72:32) “the year is exactly as to its days three hundred and sixty-four”

(74:10) “and all the days which accrue to it for one of those five years, when they are full, amount to 364 days”

(74:12) “but complete the years with perfect justice in 364 days”

(75:2) “and the exactness of the year is accomplished through its separate three hundred and sixty-four stations”

(82:6) “and the year is completed in three hundred and sixty-four days”

¹⁵ The 364-day year is suggested, but not proven, to be found also in the Babylonian astronomical texts. See W. Horowitz, “The 360 and 364 Day Year in Ancient Mesopotamia,” *Journal of the Ancient Near Eastern Society* 24 (1996) 35-44.

¹⁶ All quotations of *Jubilees* are from R. H. Charles, *The Book of Jubilees or the Little Genesis* (London: Adam and Charles Black, 1902), unless otherwise stated.

¹⁷ All quotations of *1 Enoch* are from R. H. Charles, *The Book of Enoch or 1 Enoch* (Oxford: Clarendon, 1912), unless otherwise stated.

Unlike the pseudepigraphal books, the Qumran Calendrical Documents have no explicit statement as such disclosing that they reckon the year in 364 days.¹⁸ So it is crucial to see what evidence can be gathered from these documents to support this assumption. Without an explicit statement stating the year length, it is not easy to reach a definite conclusion from the bits and pieces of calendrical information collected from the fragments. However, a characteristic feature of the 364-day year is helpful in this respect, that is the exact alignment of the year length with the number of weeks. It is only with such a fixture that a firm correlation between the weekdays and the year-days can be achieved. That the Priestly-Courses Documents' calendar has a 364-day year can be confirmed in two ways, firstly by looking at the Priestly-Courses feature in general, and secondly by studying the data in one particular document.

Confirming the Year Length by the Priestly-Courses Feature

As discussed above the Priestly-Courses Documents agree with the Jewish classical sources in reckoning the priestly service in a weekly based roster. Actually, once this reckoning is confirmed the Priestly-Courses feature of these documents already points to the 364-day year of their underlying calendar. For there is no point in integrating the weekly cycle into a calendrical system if the two are not in some way fixed in agreement. Therefore for the Priestly-Courses documents to be able to match a day of the year to a particular day of the priestly courses it is more than likely that they are taking the year as having only 364 days. However, aside from this general deduction, it is still worthwhile looking more closely at how the priestly courses are arranged and integrated into the calendrical system of these documents to ensure that their year has indeed 364 days.

¹⁸ Nevertheless, explicit statements of a 364-day year are found in other Qumran Scrolls (cf. 4Q252 2:3 and 11QPs^a 27:6-7).

A year of 364 days is equated to fifty-two weeks which means that there are the same number of duties in terms of the priestly services. In the early days of the Qumran discovery, it was announced that the scrolls evinced a novel twenty-six priestly courses division which was different from all the biblical and rabbinic traditions.¹⁹ The ground for this announcement was the discovery of a passage in the *War Scroll* (1QM 2:1-2) saying

fathers of the congregation, fifty-two. They shall arrange the chiefs of the priests behind the High Priest and of his second (in rank), twelve chiefs to serve in perpetuity before God. And the twenty-six chiefs of the divisions shall serve in their divisions and after them the chiefs of the levites to serve always, twelve, one per tribe.

Dividing the priestly services into twenty-six divisions, although different from all the known traditions, seems apt for the presumed Qumran 364-day calendar. With such an arrangement each course would serve exactly two times in a 364-day year. If the twenty-six courses were rotating in a fixed order, then each course would serve at exactly the same two weeks separating in half a year apart year in and year out. Nevertheless, as more scrolls were published this idealised system turned out to be a misconception of the Qumran Scrolls for only the twenty-four priestly names, as listed in 1 Chr 24, are found operating in the discovered manuscripts.

With the number of priestly divisions maintained at twenty-four, it would take not one but six years for the courses to fit into the 364-day year, and so a sexennial priestly cycle for the co-ordination of such has long been developed by scholars to represent this special feature of the Qumran Scrolls.²⁰ Since the sexennial cycle is a reconstruction based on the assumption of a 364-day year, the compliance of the data in the Priestly Courses Documents with the sexennial cycle will imply that the documents are also based on the 364-day year.

¹⁹ For the discussion on the alleged discovery see P. Winter, "Twenty-Six Priestly Courses," *Vetus Testamentum* 6 (1956) 215-217.

²⁰ For a table of the sexennial priestly cycle see Milik, *Book of Enoch*, 63, Figure 6.

The sexennial cycle repeats itself in every six years, therefore only six out of the twenty-four courses would serve at the beginning of the year. According to the cycle developed by scholars the courses heading the years are:

1st year	2nd year	3rd year	4th year	5th year	6th year
Gamul	Jedaiah	Mijamin	Shecaniah	Jushebeab	Happizzez

The priestly courses heading each year are enumerated in some Priestly-Courses Documents, which provides a means to confirm that the arrangement in the sexennial cycle really represents the priestly roster in these documents.

- 4Q328

1:1 [ישב]אב בששית הפצין אלה רשי השנים

The last three words of the line declare what is stated in front - “these are the heads of the years”. Although not much of the text in front survives, a name and its corresponding year are found - “in the sixth (year) Happizzez”. Also part of the word prior to these can be read and it matches with the priestly name heading the fifth year - “Jushebeab”. This surviving information agrees with the listed heads of the year.

- 4Q330

1:1 מימין באחד בחוד {•} ש הר[אשון]

1:3 שנה שנית <בשנה הח[מישית]> ישבאב

The first line shows where these priestly names are supposed to be found - “the first (day) of the first month”. Both names found in this text are among the listed year leaders, Mijamin for the third year and Jushebeab for the fifth year. In line three Jushebeab follows after “the second year”, which seems to stand as a counter-evidence against the compilation of the Priestly-Courses Documents with the assumed sexennial roster. However, immediately on top of this yearly order some words concerning the year are inserted superlinearly, which function as a correction to the words below. The order of the year in the correction is not discernible, but it strongly suggests that assigning Jushebeab to the first day of the second year is wrong. Uncertain as the reconstruction of these inserted words may be, the priestly names for

the yearly leaders in this text matching with those listed above helps to confirm the agreement between the sexennial priestly cycle and the Priestly-Courses Documents.

- 4Q319

The *Otot*-section of this manuscript is a recounting of an event called “sign” in a number of jubilee cycles. The separating interval between two consecutive events is three years. Throughout the whole *Otot*-section only two priestly names, Gamul and Shecaniah, are mentioned in the entries. Although the text does not explicitly state that these two priestly courses are the ones that serve at the beginning of the enumerated years, the fact that the signs are counted in terms of years points to the fact that these names are regarded by the text as the leaders of these years. According to the sexennial priestly cycle these two courses are the leaders of the first and the fourth years, and they do head the years exactly three years apart.

The listing of the year leaders in the three manuscripts helps to confirm that the priestly courses rotate in the Priestly-Courses Documents within the proposed sexennial priestly cycle. Hence the year length of the calendar underlying these documents can also be confirmed as having 364 days.

Confirming the Year-Length by the Calendrical Data in 4Q320

A second approach to confirming that the Priestly-Courses Documents observe a calendar with 364 days in a year is by analysing the data preserved in the festive section of 4Q320 4 iii-vi. In this section seven festivals are recounted for six years by a standard formula which records the weekday, the priestly course, and the name of the festival. The weekdays for the festivals in the six years as found in the fragments are as follows:

	<i>1st year</i>	<i>2nd year</i>	<i>3rd year</i>	<i>4th year</i>	<i>5th year</i>	<i>6th year</i>	<i>Summary</i>
Passover	3	*	3	*	3	3	3
Waving of Omer	*	*	1	1	*	1	1
Second Passover	5	*	5	*	*	*	5
Festival of Weeks	1	1	*	*	*	1	1
Day of Remembrance	4	4	*	*	*	*	4
Day of Atonement	*	6	*	*	6	*	6
Festival of Booths	*	*	*	*	4	*	4

* number not found in the extant fragments.

Except for the Festival of Booths the weekday for the individual festival can be read in at least two different years, and for the Passover it is read in four years out of six. The most obvious result in listing these surviving weekdays is that the festivals always fall on the same weekday throughout the six years. There can only be two possible explanations for the festivals falling on the same weekday every year. One is that the festivals are attached to fixed weekdays with no regard to the days of the year, for example like Easter in the Christian Church calendar. The other is that the calendar used by this text has the weekdays tied up with the days of the year, which is characteristic of the 364-day year. The first possibility can be rejected because the festivals enumerated are all biblical festivals stipulated in the Pentateuch where most of them have their dates specifically ordained. So the only reason for finding these festivals falling on the same weekday throughout the recorded six-year period is that the text is based on a 364-day year calendar.

In searching for the year length reckoned by the Priestly-Courses Documents two different approaches, a general consideration of the priestly courses arrangement and a special analysis of the data about the festivals in 4Q320, generate the same result - the calendar underlying these documents has 364 days in a year.

Matching of the Weekdays with the Days of the Year

When a 364-day calendar is operating together with a weekly cycle it is vital to know how the days of the year match with the weekdays. Before the discovery of the

Qumran Scrolls, this was not an easy question to answer. Although both *Jubilees* and *I Enoch* clearly state that their calendar has only 364 days, they speak very little about the weekdays. Attempts have still been made to solve the problem with the limited information given in these books, and the most successful and influential study is the one carried out by Jaubert in analysing the data of *Jubilees*.²¹

In retelling the history of the Israelite patriarchs, the author of *Jubilees* supplemented it by giving further information about the time of the occurrence of many of the recorded events. Writing in the same manner as his source text, the author only provided the dates of these events in terms of days and months but not weekdays. This makes one wonder whether it is likely that the author of *Jubilees* had the corresponding weekdays of these dates in his mind when he composed his book as the calendar he used provided him with such perfect co-ordination. Jaubert thought that he did. Picking up on the clue provided by Barthélemy she tried to confirm that the calendar in *Jubilees* starts its year on a Wednesday.²² Based on this clue Jaubert analysed the data in *Jubilees* with two approaches. One worked from the date of the Festival of Weeks provided in the book, and the other examined the dates of the patriarchs' journeys. Jaubert claimed that both approaches arrived at the same conclusion, that is that the year in *Jubilees* begins on the fourth day of the week. This work has ever since been widely accepted as the decisive proof for the question. Since Jaubert also perceived the calendar of *Jubilees* as identical to the one in the Qumran Scrolls, her conclusion on *Jubilees* has also been extended to the scrolls as a matter of fact. Nevertheless, the identity of the calendar underlying *Jubilees* and the scrolls is not without question, and the automatic transfer of information from one composition to the other has the danger of harmonisation ending up overshadowing the actual

²¹ Jaubert, *The Date of the Last Supper*.

²² Barthélemy's contribution to this question is his adduction of Albiruni's report on a Jewish sect called the Magharians who reckoned the New Year's Day as always being on a Wednesday. (D. Barthélemy, "Notes en marge de publications récentes sur les manuscrits de Qumrân," *Revue Biblique* 59 (1952) 187-218, 200-202.) Albiruni's account on the Magharians can be found in Albiruni, *The Chronology of Ancient Nations, An English Version of the Arabic Text of the Athar-ul-Bakiya of Albiruni or the "Vestiges of the Past"* (trans. C. E. Sachau, London: W. H. Allen and Co., 1879) 278.

differences between the two. Therefore it is necessary to look at the Qumran Scrolls on their own to see what evidence they can provide for answering this question.

Matching Weekdays and Year-Days in the Priestly-Courses Documents

More positive evidence can be found in the Priestly-Courses Documents about the question of the weekdays. When compared to the pseudepigraphal books the Priestly-Courses Documents are more concerned with the weekly cycle. Therefore the answer in these documents needs no indirect inference or complicated data analysis as in the case of *Jubilees* but rather depends on more straightforward gathering of related information. This can be achieved in two ways; one is through statements providing an explicit answer, and the other is by projecting the answer from the extant calendrical data.

Confirming the Weekday Match by Explicit Statements

Explicit statements about the weekdays can be found in several passages of the Priestly-Courses Documents. The best preserved one is in 4Q320 4 ii 10-14, which states: “the days, and for the sabbaths, [and] for the months, [and for] the years, and for the release years, and for the jubilees on the 4 of the week of the sons of Gamul.” (הימים ולשבתת [ו]לחדשים [ול]שנים ולשמטים וליובלות ב//// בשבת בני גמול). The text before these lines is lost, so exactly what this passage is about is unclear. However, judging from what is extant the text seems to put all the calendrical units, from the shortest (day) to the longest (jubilee), in relation to the phrase “the 4 of the week of the sons of Gamul.” The association of the time units with the fourth day of Gamul denotes that the reckoning of all these units is based on or started with the fourth day of the week. Therefore although the passage in 4Q320 does not explicitly say that “the beginning of the year is on the fourth day of the week”, the implication is obvious.

The phrase “on the fourth of the week of the sons of Gamul” is also found, although incomplete, in two other locations of the same manuscript.

- 4Q320 1 i 3-4 ב[ב] שב[ב] [בני ג]מול

The section where these words are found is concerned with the recounting of a recurring event, and the words are connected with the first appearance of the event. The day of this appearance is not explicitly expressed within these lines but it can be worked out by extrapolating from the data following. The rest of the section shows that the event recurs in a period of alternating twenty-nine and thirty days. In line 1 i 6 is the entry for the second occurrence, where it relates that the event is on the 30th of the first month and there is a period of twenty-nine days between this and the previous occurrence. This allows the date of the first occurrence to be worked out as the first day of the first month. From this we can infer that the first day of the year is on the fourth day of the week.

- 4Q320 2 i 4-5 ב[ב] שב[ב] [בני ג]מול ל רֹשׁ כָּל הַשָּׁנִים

This sentence if extant in full would form the most explicit evidence for the year beginning on a particular weekday. Unfortunately, the number for the weekday is partly damaged. With the help of the recovery of the phrase in the other two locations of this manuscript the restoration is almost certain. Together they all point to the same conclusion: the first day of the year falls on the fourth day of Gamul.

Besides 4Q320 there is another possible case for finding an explicit statement regarding the weekday of the first day of the year in the concluding passage of 4Q319. The passage is cited by Milik in his 1978 article:

and for the] weeks ... [of their da]ys [... and for the] fea[s]ts] of their [days,
and for the] month[s of their years, and] for the signs [of their re]lease years,
and for the jubilees in the week [of the son]s [of Gamu]l on the fourt[h d]ay²³

²³ Milik, “Écrits Préesseniens,” 93.

However, the lack of this passage in the final photographs of the manuscript does not allow one to check on Milik's reading. The passage is similar to the one in 4Q320 4 ii, except that it is more damaged and a lot of the words need to be reconstructed. Based on Milik's reading the passage is able to form supporting evidence to confirm that "day fourth of Gamul" is the foundation for the enumeration of the time units.

Confirming the Weekday Match by Calendrical Data

In the sixteen Priestly-Courses Documents there are abundant data providing the match between the weekdays and the year-days. However, not all of them are suitable for being used to work out the weekday for the New Year's Day. To calculate this answer from data of months other than the first month requires the knowledge of the monthly structure which is the area of our next investigation. In order to avoid circular arguments this section will be restricted to using only data about the first month. Two sets of data fulfil this requirement.

It is unnecessary to go into the details about the nature and structure of the section in 4Q320 1 i-iii as a line of its extant data is sufficient to provide the necessary answer. In 1 ii 4 an entry ברישון ב 3 ב 3/////////ל במלכיה //ב is preserved entirely. Putting aside the middle part (3/////////ל) of the entry, the answer comes from the first and the third parts of the line. For each of the standard entries in this section, we know that (1) the first part marks the weekday of the event in terms of the priestly courses; (2) the third part recounts the date of the event in terms of days and months; (3) and both the first and the third parts refer to the same date. So this line informs us that the twentieth of the first month is the second day of the service of Malchijah (ברישון ב 3 = במלכיה //ב). The sabbath for this Malchijah to start its service on is the eighteenth of the first month. From this it can be worked out that the first day of this month must be on the fourth day of the week.

The other passage providing the necessary information for the weekday of the day beginning the year is from 4Q325. In fragment 1 of the manuscript some festivals

and the sabbaths of three months are recounted. The last two lines of the fragment disclose that the months concerned are from the first to the third of a year. The first two lines of the fragment give the dates for some sabbaths of the first months: 1:1 “On the eighteenth of it is the sabbath” (בשמונה עשר בו שבת) and 1:2 “On the twenty-fifth of it is the sabbath (בעשרים וחמשה בו שבת). From these the other two sabbaths in this month can easily be worked out to be the eleventh and the fourth, and then it is not difficult to find out that the first day of this month is on the fourth day of the week.

The calendrical data in these two passages provide further confirmation to what has already said clearly in the explicit statements: the calendar of the Priestly-Courses Documents has the fourth day of the week as its first day of the year.

Monthly Structure

The final aspect to be looked at about the construction of the Priestly-Courses Document's calendar is its monthly structure. Even for calendars reckoning the same year length, the arrangement of the months can still be very different.²⁴ Different models for the monthly arrangement can be derived from the pseudepigraphal books. Of course it is possible that none of these models is the one underlying the Qumran Calendrical Documents, but they form a useful framework for testing the data retrieved from these documents. The models of the pseudepigraphal books will be discussed first before looking at the evidence of the Priestly-Courses Documents.

²⁴ For example see the different calendars in the cities of the Roman world after the calendrical reform carried out by Julius and Augustus. See A. E. Samuel, *Greek and Roman Chronology: Calendars and Years in Classical Antiquity* (München: C. H. Beck'sche Verlagsbuchhandlung, 1972).

Monthly Structures in 1 Enoch

Among the five books of *1 Enoch* the *Astronomical Book* is the one that is rich in discussion of astronomical and calendrical matters. However, this book, like *1 Enoch* as a whole, is not a coherent single work but a composition of various astronomical treatises. Therefore it is not surprising to find different monthly arrangements in its chapters.

At least two monthly structures can be extracted from the *Astronomical Book*. The first one is quite unusual because its months together do not add up to a 364-day year. In various sections of the book astronomical calculations are found based on a twelve 30-day months system, one that is similar to the ideal calendar of the ancient Mesopotamian astronomical texts.²⁵

- 72:6-36

This is a section calculating the ratio between the day and night length. Although the number of days in a year is explicitly stated as 364 (72:32), and some months are said to have thirty-one days, the pattern for the change of ratio between the length of day and night is based on a linear function taking all the months with a constant equal length.²⁶

- 72:35

The verse states: "And this is the law and the course of the sun, and his return as often as he returns sixty times and rises." The number sixty refers to the number of days

²⁵ The Mesopotamian origin of the Enochic astronomy is proposed by several scholars, for examples. Neugebauer, Glessmer, Albani.

²⁶ For the linear pattern of the daylight variation in a year see O. Neugebauer, "The 'Astronomical' Chapters of the Ethiopic Book of Enoch (72-82)," in M. Black (ed.), *The Book of Enoch or 1 Enoch: A New English Edition* (Leiden: Brill, 1985) 386-419, 394, fig. 1.

that the sun passes through each of the six gates in its yearly journey.²⁷ Each year the sun travels through each gate twice and each time for a month. Hence the months are taken as having only thirty days.

- 74:10-11

This is a section on the comparison between the lunar and the solar year. The thirty days difference in five years shows that the solar year used in comparison with the 354-day lunar year is reckoned as having 360 days despite the explicit statement that a year has 364 days in verse 10.

- 74:17

This verse states: “And the year is accurately completed in conformity with their world-stations and the stations of the sun, which rise from the portals through which it (the sun) rises and sets 30 days.” Again the sun is regarded as travelling through each gate in a regular period of thirty days with which the year is said to be accurately completed.

So how in the *Astronomical Book* can this reckoning of regular 30-day months which make up to only 360 days a year be reconciled with the repeatedly emphasised motif of a 364-day year? An answer is given in 75:1

And the leaders of the heads of the thousands, who are placed over the whole creation and over all the stars, have also to do with the four intercalary days, being inseparable from their office, according to the reckoning of the year, and these render service on the four days which are not reckoned in the reckoning of the year.

Although the cosmic order of the stars does play a role for these four special days, they are not to be counted in the reckoning of the year. The various statements and

²⁷ Neugebauer in “Astronomical Chapters” points out that the number “sixty” is omitted in several manuscripts and regards this a better version and so does not translate it.

calculations quoted above can be regarded as following this teaching by not taking into account the four extra days. This allows the remaining days to be put into twelve regular months of thirty days. So it can be said that in *1 Enoch* one way of structuring the 364 days into months is to have twelve months of 30 days together with four intercalary days which are not counted in any of these months.

In strict contrast, another reckoning method which fully recognises the four intercalary days is also present in the *Astronomical Book*. Similarly, this reckoning has its supporting statement. In *1 Enoch* 82:6 it reads: “For they [the four intercalary days] belong to the reckoning of the year and are truly recorded for ever, one in the first portal and one in the third, and one in the fourth and one in the sixth”. According to this verse the four intercalary days are reckoned with their precise positions in the annual cycle. The passage locates them in various gates of the sun’s journey, which reveals that they are distributed in different months. The locations of these intercalary days are recorded more explicitly in chapter 72 where the position of the sun in terms of the gates and the number of days in each month is enumerated month by month.

Month	Gate	Number of Days
1	4	30
2	5	30
3	6	31
4	6	30
5	5	30
6	4	31
7	3	30
8	2	30
9	1	31
10	1	30
11	2	30
12	3	31

According to this enumeration the four intercalary days are located as the last day of each quarter of the year at the end of the third, the sixth, the ninth, and the twelfth month. This constitutes the second way of structuring the months in *1 Enoch* which equally divides the year into four identical quarters, each with a 30-30-31 (days) pattern.

Monthly Structure in Jubilees

Unlike the astronomical chapters of *I Enoch*, *Jubilees* does not focus on astronomical and calendrical matters so information about its calendar is relatively sparse. Gleaning the limited calendrical information from various passages, some ideas about the calendar of the book can be summarised as such:

- The year contains 364 days (6:32, 38).
- The year is divided into fifty-two weeks (6:30).
- The year is also divided by the four days of remembrance into four seasons, each of thirteen weeks (6:23, 29).
- The number of the months of the year is twelve (25:16).

The gathered information shows that the year of *Jubilees* has four seasons, each season has three months, and the three months total to thirteen weeks. There is no doubt that each of these seasons contains three 30-day months plus one additional day. The problem is that *Jubilees* does not state when this day is added. Based on the days of remembrance in *Jub.* 6:23-30, some scholars propose that the extra day is located at the beginning of each quarter.²⁸

On the first of the first month, the first of the fourth month, the first of the seventh month, and the first of the tenth month are memorial days and days of the seasons. They are written down and ordained at the four divisions of the year as an eternal testimony. Noah ordained them as festivals for himself throughout the history of eternity with the result that through them he had a reminder. ... For this reason he ordained them for himself forever as memorial festivals. So they are ordained and they enter them on the heavenly tablets. Each one of them (consists of) 13 weeks; their memorial (extends) from one to the other: from the first to the second, from the second to third, and from the third to the fourth. All the days of the commandments will be 52 weeks of days; (they will make) the entire year complete.

²⁸ See J. Morgenstern, "The Calendar of the Book of Jubilees, Its Origin and Its Character," *Vetus Testamentum* 5, no. 34-76 (1955) 36-37 & 60-61; and Snyder, "Mishmarot Calendars" 38-40.

The scholars take the four remembrance days in the passage as the four intercalary days, which according to the passage are located as the first day of the first, the fourth, the seventh, and the tenth months. This constitutes another possible 364-day monthly arrangement, one with a quarterly 31-30-30 (days) pattern. Although what is stated in *Jubilees* 6 only alludes to such an arrangement, it is sufficient to be regarded as a possible model for the testing of the monthly structure in the Qumran Calendrical Documents.

Summarising the discussion of the monthly structure in *Jubilees* and *1 Enoch*, there are three possible models in arranging the 364 days into months.

- Model 1 - twelve months of 30 days (*1 Enoch* 75:1)
- Model 2 - twelve months in a quarterly sequence of 30-30-31 days (*1 Enoch* 72)
- Model 3 - twelve months in a quarterly sequence of 31-30-30 days (*Jubilees* 6)

The extant data of the Calendrical Documents will be tested against these three models to see whether they conform to any one, more than one, or even none of them.

Monthly Structure of the Priestly-Courses Documents

Not every Priestly-Courses Document provides information on the monthly structure of its calendar. However, if they are considered as a whole some of the manuscripts do provide sufficient information to demonstrate how the months are ordered in this group of documents.

The section that is deemed to provide the exact answer for this question is 4Q320 2 ii - 4 i, which is supposed to list the months one by one with their corresponding number of days and the leading priestly course for the six-year cycle. If it survived there would be no more doubt about the monthly arrangement in these documents. Unfortunately, only a very few words of it are extant with no conclusive result that can be drawn. Despite this disappointing section a definite answer can still

be extracted from other sections although they are not specially designed to state the monthly structure.

4Q320 1 i-iii

This section lists the recurrence of an event with three elements: the weekday, the duration separating two consecutive events, and the date in days and months. Most of the second and third elements are extant for the first sixteen entries from which the number of days for fifteen months can be calculated.

Lines	Days between the events	Date	Month/Year	Number of days in the month (calculated) ²⁹
i 1-5		1/1		
i 6	29	30/1	1 / First	30
i 7	30	30/2	2	30
i 8	29	29/3	3	30
i 9	30	29/4	4	31
i 10	29	27/5	5	30
i 11	30	27/6	6	31
i 12	29	25/7	7	30
i 13	[30]	25/8	8	30
i 14	[29]	24/9	9	31
ii 1	30	23/10	10	30
ii 2	29	22/11	11	30
ii 3	30	22/12	12	31
ii 5	29	20/1	1 / Second	30
ii 6	30	20/2	2	30
ii 7	29	19/[3]	3	31
ii 8	30	18/[4]	4	

[] - missing data reconstructed

The calculated result is rather astonishing for it shows an irregular monthly sequence distinct from any of the proposed patterns. First of all, the months with

²⁹ The number of days in the month can be calculated by adding the number of day of that month to the days of separation between the two events in the next line and then subtracting the number of the day of the next month. Take month 12 of the first year for example, the number of days = 22 + 29 - 20 = 31 days.

thirty-one days distinguish the resultant calendar from the regular thirty days month pattern. They show that the four intercalary days are taken into account in counting the days of the months. However, the four extra days are placed in the fourth, the sixth, the ninth, and the twelfth months, a form which is different from the other two models. Moreover, the result is also inconsistent within itself. It provides the third month of the second year with thirty-one days contrasting to the thirty days of the same month in the first year. Also from the seventh month of the first year onward a regular quarterly pattern of 30-30-31 (days = 91 days) is revealed for three seasons, whilst the first two quarters of the first year have irregular patterns of 30-30-30 (days = 90 days) and 31-30-31 (days = 92 days).

Unless one accepts that the monthly arrangement in the Priestly-Courses Documents is irregular, one has to consider that some mistakes must have entered into these data. In fact all the mentioned irregularities can be easily smoothed out by a slight adjustment of the data. If the date in line i 9 is 28/4 instead of 29/4, then the third month of the first year will have thirty-one days and the next month will have thirty days, and all the months in the table will then follow a regular 30-30-31 (days) pattern. That the number twenty-eight could be written as twenty-nine by mistake is not only arguable from the regularity of the data but also understandable knowing how easily such a mistake could happen. The numbers are written in a numeric cipher which has a symbol standing for the twenty and numbers of vertical strokes representing the remaining digit. In this case the difference between the supposed correct and mistaken numbers is only one extra stroke alongside the eight others. With such tedious work of repeatedly enumerating days and weeks, it would be very easy for the scribe to miscount a day or simply to give one stroke more to the number than he intended to write. By rectifying this error the monthly pattern revealed in this section is exactly the same as Model 2, the quarterly 30-30-31 (days) pattern.

4Q321 1 i-2 i

The *duqah* section of 4Q321 enumerates the occurrences of two events by the double dating method providing both the weekdays according to the priestly courses and the

corresponding dates by the days and months. Since both dating methods are referring to the same day, by comparing the duration between the weekdays the number of days in the months can be deduced. Although most of the text in this section can be restored according to an assumed format of the calendar, at the moment in order to test the validity of the assumed structure only data which survived in the extant fragments will be considered. The corresponding pairs of dates in the surviving data are found in:

Line	Date	Weekday
1 i 7	20/2	4
1 iii 8	30/2	7
2 i 2	5/7	1
1 ii 4	2/8	7
2 i 3	5/8	3
2 4	4/9	4
1 i 3	23/10	5
1 iii 6	2/11	7
1 i 4	22/11	6
1 iii 7	18/12	4
1 i 5	22/12	1
1 ii 8	28/12	7

From these data the weekday for the first day of some of the months can be worked out.

Month	Weekday
1/2	6
1/7	4
1/8	6
1/9	1
1/10	4
1/11	6
1/12	1

While the isolated datum of the second month gives no information on the duration of the months, the other six consecutive months provide a precise idea of the number of days for the seventh to the eleventh months. Between 1/7 to 1/8, 1/8 to 1/9, 1/10 to 1/11, and 1/11 to 1/12, the number of days separating the beginning of the months are four weeks plus two days, that is thirty days, thus they confirm that the seventh, the eighth, the tenth and the eleventh months have thirty days. However, between 1/9 to

1/10 the separating duration is four weeks and three days, so the ninth month is a 31-day month. Therefore, the number of days in these months are:

Month	7th	8th	9th	10th	11th
No. of days	30	30	31	30	30

This result shows that the monthly structure of this manuscript agrees with Model 2, the 30-30-31 (days) pattern and differs from the other two.

4Q324a 1 ii

Out of this small fragment concrete evidence can still be retrieved for the detection of the monthly structure of the Priestly-Courses Documents. The text records the time of entering of the priestly courses as well as the beginning of the months. In the three lines of this fragment three sets of data are recovered:

- Line 2 Entering of a priestly course (Malchijah) is on 28/9
- Line 3 1/10 is on the 4th day of this course
- Line 4 Entering of the next course (Immer) is on 4/10

Information in lines 3 and 4 confirms that the entering of the priestly courses takes place on the sabbath. Therefore if 28/9 is a sabbath and 1/10 is the fourth day of the week, this implies that the ninth month has thirty-one days. This information, although simple, is sufficient to reject Model 1 and 3 and it shows that the monthly structure here agrees with Model 2.

The results of testing the proposed monthly structure models with the extant evidence of the Priestly-Courses Documents show that all the manuscripts which are able to provide sufficient information for working out the number of days in the months disclose a monthly sequence which matches Model 2 - the quarterly 30-30-31 (days) pattern. All of them stand against Model 1 - the regular twelve 30-day months year which does not count the four intercalary days, and Model 3 - the hypothetical 31-30-30 (days) pattern based on *Jubilees* 6. With the evidence from these

manuscripts we can now safely conclude that the Priestly-Courses Documents are based on a calendar with a monthly structure which follows the quarterly pattern of 30-30-31 days.

After the investigation of the structure of the underlying calendar of the Priestly-Courses Documents by asking questions on the three important aspects three firm conclusions can be reached about this calendar:

1. It reckons a year with 364 days.
2. It matches the days of the year with the weekdays by having the New Year's Day always on the fourth day of the week.
3. The 364 days of the year are subdivided into twelve months following a quarterly 30-30-31 (days) pattern.

CALENDRIAL STRUCTURE OF THE NON-PRIESTLY-COURSES DOCUMENTS

It is now time to look at the remaining five manuscripts, the Non-Priestly-Courses Documents which, not having the benefit of a common feature ensuring the identity of their calendar, have to be studied individually.

4Q317

The text in this manuscript is concerned with a day to day enumeration of the phase change of the moon. The moonlight is divided into fourteen parts with one part increasing or decreasing in a day during the waning and waxing periods. This changing amount of moonlight is recounted against the days of a certain calendar, and it is the structure of this base calendar which is being investigated. Although there are many fragments found of this manuscript, only the second column of fragment 1 provides data on the dates of the calendar. This column covers from day 5th to day 25th of a certain month.

Lines	Date	Parts of light covered	Parts of light revealed	Weekday
2-3	5	[12]		
3-4	[6]	13		
5-6	7	[14]		
7-10	8	dark moon		day one
10-11	[9]		1	
12-13	10		[2]	
13-14	[11]		[3]	
15-16	12		[4]	
16-17	[13]		5	
18	14		[6]	
19-20	15		[7]	
20-21	[16]		8	
22	[17]		[9]	
23	[18]		[10]	
24	19		[11]	
25	20		[12]	
26	21		[13]	
27-29	22		full moon	?
30-31	23	[1]		
32	24	[2]		
33	25	[3]		

[] - missing data reconstructed

Tabulating the information of this column discloses that much of its data are no longer extant in the fragment but has to be restored by extrapolating from the surviving material. However, the validity of the reconstructed data should not be played down. The fact that words are preserved in almost every entry of the column, and the regularity of the format for the entries greatly facilitate the reconstruction.

Two remarks have to be made before discussing the data of this text with regard to the structure of the calendar.

1. On the continuity of the column - Although the fragment consists of two separated segments that have no direct physical connection, their relative positions in PAM 43.375 forming part of a larger composite fragment is assumed. The assembly is supported by both the physical evidence (such as the cleavage line on the right margin of both segments) and the content (such as the continuity of the

numbers found in the two). It is based on this assumption that the thirty-three lines of this column are reconstructed.

2. On the correction of the numbers - All the numbers representing the monthly days found in the column show signs of emendation, and the adjustments are without exception by shifting the original number to one number up. The purpose of this correction is uncertain. This ambiguity will no doubt hinder any analysis of the data of this manuscript and is unlikely to be resolved imminently or even easily. With this uncertainty in mind this study approaches the data with a simple basic assumption, that is that the correction is supposed to be correct.

Regarding the structure of the calendar there is not much that we can learn from these data. However, one thing for sure is that this calendar is not a lunar one. The characterising feature of a lunar calendar is that its days of the months are connected to the phases of the moon, and the usual arrangement of a lunar calendar is to have its months beginning with either the full moon or the new moon. However, the retrievable data in the column does not agree with that. It shows that the full moon falls on the 22nd and the dark moon on the 8th of the month. Moreover, to recount the phases of the moon within a lunar calendar requires only a cycle of one month or at most two (showing both the hollow 29-day month and the full 30-day month), but the various fragments of this manuscript demonstrate that definitely there are more than two lunar cycles being recounted.

Other than confirming that the calendar in 4Q317 is not a lunar one, a little hint from the data may be able to suggest what this calendar is. In most of the entries the lunar phase is only recounted against the days of the months, but when the text comes to the transitional phases of the moon a further piece of calendrical information is provided, which is the weekday. Three records of the weekday are found in the fragments.

Line	Weekday	Corresponding Date
1 ii 10	באחד לשבת day one	eighth day of the month
2:9	בארבע לשבת day four	
4:8	ארבע לשבת day four	

The incidences of recording the weekday alongside the day of the month reflect that there must be a certain connection between the two, and such a connection points to the characteristic of a 364-day calendar.

Only one pair of corresponding data is preserved in the fragments, that is that the 8th day of a month = first day of the week (1 ii 10). From this limited piece of information it is difficult to judge the entire structure of the calendar, but it can still be used to test whether it is for or against the structure that has been detected in the previous section. In the confirmed calendar of the Priestly-Courses Documents because of its identical quarterly pattern any one of its monthly days do not fall on all the weekdays but on only three. To take an example, the first day of the month in this calendar could only happen with the first, the fourth, and the sixth day of the week. Similarly, the eighth day of the months being exactly a week after the first day of the months could also fall on only these same weekdays. The surviving weekday datum of 4Q317 agrees with this structure. In order to give more weight to this agreement the surviving datum can also be tested with another possible model of a 364-day calendar. Consider a calendar with Model 3 monthly structure - the quarterly 31-30-30 (days) pattern. Assuming this calendar also has a year beginning on the fourth day, the eighth day of the months would then fall only on the second, the fourth, and the sabbath of the week but never on the first day. Thus the datum in 4Q317 does not agree with this assumed structure.

To conclude, the results in searching for the structure of the calendar underlying 4Q317 are (1) this calendar is definitely not based on the lunar cycle; (2) it is likely to reckon a year having only 364 days; (3) assuming the year begins on the fourth day of the week it agrees with the quarterly 30-30-31 (days) pattern but not with the 31-30-30 (days) one.

4Q324b

No calendrical element is found in the preserved text of this manuscript. Although it is given the title "Calendrical Document", its calendrical nature is doubtful. The only element which is likely to link it with other Calendrical Documents is the possible

reading of a priestly name in fragment 2, but even that is uncertain. With only the last two letters of the word being read, the original editors restore it as יחזקאל, but it could equally be any word ending with these two letters. Another possible reason for the editors to identify this manuscript as such is the reading of names that may be related to historical figures, that is יוחנן and שלמציין in fragment 1. Texts bearing the names of historical figures are rare amongst the corpus of the Qumran Scrolls, but outside the group of Calendrical Documents there are still a few that have this uncommon feature.³⁰ The names in this manuscript cannot be regarded as a definite clue to support this text's calendrical nature. The lack of any calendrical element renders the study of the structure of the calendar, if there is any, underlying this manuscript impossible.

4Q324c

This manuscript is extremely fragmentary. Having a total of sixty-one fragments in the final photographs, all of them are minute with a few recognisable letters or even no discernible characters at all. This does not seem very promising in comprehending the nature of its content, let alone its calendrical structure. Nevertheless, two features of the wording retrieved from these fragments can still give some idea of the content of the original text.

1. The word “שבח”

An outstanding feature within the texts in these fragments is the frequent occurrence of the word שבח. Out of the eighteen cited fragments the word can be read completely on seven occasions (fragments 3, 2, 30, 31, 32, 34, 49) and partially in another three (fragment 2, 3, 12a), which makes up nearly half of all the identified words in this manuscript. This strongly suggests that at least part of this work was written with a regular repetitive formula which has the word as its

³⁰ For confirmed and alluded reading of names referring to historical figures see B. Z. Wacholder, “Historiography of Qumran: The Sons of Zadok and Their Enemies,” in F. H. Cryer and T. L. Thompson (ed.), *Qumran Between the Old and New Testaments* (JSOT Supplement Series 290; Sheffield: Sheffield Academic Press, 1998) 347-377, 363-370.

standard entry. On several occasions some letters before and after the word are extant, and they also show some regularities. The last letter of the word in front of the שבת can be read at three locations (22:3, 32:2, 34:1) and it is invariably the letter י. On two other occasions (3:1, 22:3) the letter following the word is preserved and in both cases it is a ב. These together suggest that perhaps part of a standard formula in this text reads like “... ב שבת ...”.

2. The numbers

Among the rest of the identifiable words most of them are numbers. Some of them have the whole word of the number preserved, such as in 21:3, 26:2, 46:2 and 46:3, and the others can be confidently reconstructed, like those in 1:2, 12a:2, 12b:1, 13:2, 47:2 and 47:3. Apart from a few being ordinal, most of these numbers are cardinal. This rich retrieval of numbers in the fragments hints that the standard formula of the text also contains some numbers.

Putting these two characteristic features together, it is most likely that part of the manuscript involves the enumeration of the sabbaths according to their days and months. The first sabbath of the months would probably have the order of the month provided by a standard formula like “On *a certain day* of *a certain month* is a sabbath” (ב ... ב ... שבת), whereas the other sabbaths of the months would be simply expressed by “On *a certain day* of it is a sabbath” (ב ... בו שבת).

The enumeration of the sabbaths implies a correspondence between the weekdays and the days of the year. By this we can deduce that the underlying calendar of this manuscript is a 364-day one. However, regarding the other aspects of the calendar, that is the monthly structure and the weekday correspondence, the fragments provide no hint at all for there is not a single entry that can be read with certainty.

4Q326

Although not much text of this manuscript is preserved, what can be read of the limited number of words reveals that it had quite a rich content on the subject of the calendar. It enumerates on a month to month basis the first and the last days of the

month, as well as the sabbaths and the festivals. The enumeration of these calendrical entries with their corresponding weekdays confirms the 364-day year nature of its calendar.

The only surviving fragment of this manuscript contains several entries that belong to the same month. Some words in the last line of the fragment provide the clue for the order of this month. The small gap in the line indicates that there is a break between two sections of the text. The words **בשני רואנש** following after the gap suggest that the first entry of the latter section is likely to be concerned with the beginning of the second month. Therefore, the entries of the former section could only belong to the first month of the year.

Depending on how one interprets the first two lines of the fragment³¹, the weekday for the first day of the first month may have been explicitly stated in line 2, which states: “on the first (day of the month), (which is) on the fourth (day of the week)” (**באחר ברביעי**). This is confirmed by the entry in line 3, “on the 11 of it is a sabbath” (**ב - / בו שב**). If 11/1 is a sabbath then the New Year’s Day (1/1) has to fall on the fourth day of the week.

Since only calendrical data for the first month are found in the fragment, there is not much it can tell us about the monthly structure of its calendar. The first part of line 6 shows that it contains a number which is probably concerned with the last day of the month. The number found is thirty. So if the interpretation is correct, then it discloses that the first month of this calendar has only thirty days. This result agrees with the Models 1 and 2, but rejects Model 3 of the proposed monthly structure.

4Q327

At least two things are present in this text, one is the sabbaths listed in their days and months, and the other is some festivals recorded with their days, months, and weekdays. Both of these elements verify the 364-day year nature of the calendar employed in this work.

³¹ See textual notes in chapter two for possible restorations and interpretations in pages 144-145.

The fragments preserve, in numerous cases, the days of the sabbaths, but not monthly order, with a possible exception in 2 iii 10. Putting aside the ambiguous reading for the moment, the days for the sabbaths retrieved in the fragments of this text are useful in helping us to understand the structure of its calendar. The days for the sabbaths found in the various fragments are:

Fragment	Days for the sabbaths
1 i	16, 23, 30
2 i	23, 30
2 ii	28
2 iii	18, 25

The identical days for the sabbaths found in 1 i and 2 i suggest that the year is subdivided into short periods where the matching of the monthly days with the weekdays is repeated. Judging from the collected data the text contains three possible patterns for the days of the sabbaths in the months:

- (2), (9), 16, 23, 30
- (4), (11), 18, 25
- (7), (14), (21), 28

These sabbath patterns concur with those of the calendar of the Priestly-Courses Documents. This concurrence strongly suggests the structure of this manuscript's calendar is identical to the one of the Priestly-Courses Documents.

The identity of this manuscript's calendar is further supported by the difficult reading about the monthly order in 2 iii 10. The first two letters of the word in question could be read as **בב** and the partially damaged third letter could possibly be a **ב**. Without the help of the content it is difficult to decide what this word is. However, the word **בשני** in line 9 suggests that here in lines 9-10 is an entry for a month's first sabbath which falls on the 2nd of the month. According to the Priestly-Courses Documents' calendar this could only happen with the second, the fifth, the eighth, and eleventh months. The agreement between the reading of the word and the supposed calendar provides mutual support for both the restoration of the word and the investigation of the structure of the calendar. On the one hand it supports the

restoration of the word in line 10 as בַּחֲמִישִׁי שֶׁנִּי and on the other hand it also confirms that the calendar underlying this manuscript is the same as the one in the Priestly-Courses Documents.

CONCLUSION

Following the completion of the analysis of all the Qumran Calendrical Documents with regard to the structure of their underlying calendar, the most pressing question is whether these texts concur or diverge in this respect. The investigation was conducted by separating the documents into two groups - Priestly-Courses and Non-Priestly-Courses Documents. Questions on three different aspects of the calendar were then asked about these documents: the number of days in a year, the matching between the weekdays and the days of the year, and the arrangement of the days into months. The results of the investigation can now be summarised in the table below:

	Priestly-Courses Documents	Non-Priestly-Courses Documents				
Manuscript		4Q317	4Q324b	4Q324c	4Q326	4Q327
Year length = 364 days	confirmed	likely	no information	likely	most likely	most likely
NYD = day fourth of the week	confirmed	conformed	no information	no information	confirmed	confirmed
Quarterly pattern of months = 30-30-31 days	confirmed	conformed	no information	no information	conformed	confirmed

With the characteristic feature of employing the priestly courses as a calendrical reckoning unit the Priestly-Courses Documents have the benefit of collecting evidence from thirteen manuscripts in the search for the structure of their calendar. In this manner affirmative conclusions can be reached in all three aspects of the investigation. In contrast, without a common feature to ensure the similarity of their calendar the confirmation of the structure of the calendar in the Non-Priestly-Courses is more difficult. Nevertheless, some conclusions can still be drawn from this group of texts. Regarding the length of the year, with the exception of 4Q324b which does not supply any calendrical information, all the Non-Priestly-Courses Documents show

signs of reckoning the year with 364 days. As for the matching of weekdays, two documents, 4Q326 and 4Q327, provide sufficient evidence to confirm that they have their years starting on the fourth day of the week, whilst the two other documents, 4Q324b and 4Q324c, supply no information at all. 4Q317 does not have sufficient information to reach a definite result but its single piece of useful datum agrees with the conclusion that the year begins on the fourth day of the week. Concerning the monthly structure, the same two manuscripts, 4Q324b and 4Q324c, have nothing to say. While 4Q327 confirms the quarterly pattern of 30-30-31 days, the two other manuscripts, 4Q317 and 4Q326, though they cannot be confirmed with this reckoning, do show signs that agree with it.

The investigation on the calendrical structure of the Qumran Calendrical Documents has produced no surprises. The structure that can be confirmed in these documents is the one that has long been proposed by scholars even back in the very early stage of the study of the Qumran calendar. The 364-day year, the year beginning on the fourth day of the week, and the quarterly 30-30-31 days pattern are all well known features of the assumed Qumran calendar. What this investigation has achieved is not to propose any alternative rendering to these features but to confirm that this well assumed calendrical structure is indeed supported by the Calendrical Documents. Most of the members of this set of documents provide positive evidence to confirm this structure, and none of the members provide any negative evidence. This helps to settle the questions about the variation of the forms of the Qumran calendar. At least with the Qumran Calendrical Documents we can now conclude that there exists only one form of the 364-day calendar.

Chapter 4

Lunar Reckoning in the Qumran Calendrical Documents

Reckoning the calendar according to the celestial bodies' movement is a common practice among human civilisations. The circuits of the two main heavenly bodies, the moon and the sun, and their resulting natural phenomena form the basic control for almost all known calendrical designs. Nevertheless, although nearly all calendars possess some kind of link with both the solar and lunar cycles, the incompatibility between their periods forces calendrical designers to make a choice between the two. Thus, in general, calendars can be classified as either solar or lunar. In this sense the particular calendar found in the Qumran Scrolls is commonly regarded as a "solar calendar".¹ Undoubtedly the characteristic feature of this calendar - the 364-day year - points to its inclination to the solar cycle rather than the lunar one. The term "solar calendar", however, has masked the lunar component of the calendar in the Calendrical Documents. The lunar cycle does play an important role in some of these documents, which has caused debate among scholars about the function of the lunar cycle in the Qumran Scrolls as a whole. The aim of this chapter is to analyse the lunar related material in the Calendrical Documents to discover the nature and function of the lunar reckoning in the Qumran calendrical system.

INFLUENCE FROM *JUBILEES* AND *1 ENOCH*

Before the Qumran discovery a 364-day calendar was already known from *Jubilees* and *1 Enoch*. The resemblance of the Qumran calendar in this special feature has inevitably made the pseudepigraphal books important source material for the understanding of its nature. Without exception, the role of the lunar cycle in these books has significantly affected the understanding of the lunar material in the Qumran

¹ Recently the term has been challenged by Glessmer in "Calendars in the Qumran Scrolls", 230-231.

Scrolls. Therefore it is necessary to know how the lunar cycle is portrayed in *Jubilees* and *I Enoch* before looking at the evidence of the Calendrical Documents themselves.

Solar Supremacy in Jubilees

The hostility of *Jubilees* towards lunar reckoning is well known. In the book the most extensive section concerning the calendrical reckoning comes in chapter 6, where God commands the children of Israel that they must observe their sabbaths, feasts and appointed times according to the prescribed ordinance, and especially to guard the years in the exact number of 364 days. It also warns them of the danger of straying from these commands for then they will “disturb all their seasons, and the years will be dislodged from this (order)”. (v. 33) As a result they “will not find the path of the years, and will forget the new moons, and seasons, and sabbaths, and they will go wrong as to all the order of the years.” (v. 34) Then the book further describes this transgression as “walking according to the feasts of the Gentiles after their error and after their ignorance.” (v. 35) However, the most striking point relevant to the present discussion is that this exhortation foretells that the sons of Israel will fail in keeping the sacred ordinance in a particular way:

36. For there will be those who will assuredly make observations of the moon - now (it) disturbs the seasons and comes in from year to year ten days too soon. 37. For this reason the years will come upon them when they will disturb (the order), and make an abominable (day) the day of testimony, and an unclean day a feast day, and they will confound all the days, the holy with the unclean, and the unclean day with the holy; for they will go wrong as to the months and sabbaths and feasts and jubilees.

Jubilees' opposition is explicitly against those who use the moon in determining the seasons and feasts. For in so doing they may mistake an unclean day as holy or a holy day as unclean. This is put in connection with a serious defilement - the eating of “all kinds of blood with all kinds of flesh”. (v. 38) The author is not only sounding a

warning note about the danger of making such an error but he puts these words into God's mouth. In the book God warns Moses: "for after thy death thy children will disturb (them), so that they will not make the year three hundred and sixty-four days only". (v. 38) Foretelling the error in this way vividly reflects a calendrical polemic at the time of the writing of the book, at least between the author and some other Israelites who regulated their calendar by observing the moon. Who these people were and what calendar they held are questions that remain unanswered, but the outright condemnation of the observation of the moon provides evidence which shows that any form of calendrical reckoning related to the lunar cycle would be in direct opposition to the prescriptions of *Jubilees*.

In *Jubilees* the campaign against lunar reckoning is not just found in chapter 6 but resounds in other locations, only in these latter cases the polemic is formulated by raising the status of the sun above that of the moon. One such passage upholding the supremacy of the sun is *Jub.* 2:8-9:

8. And on the fourth day He created the sun and the moon and the stars, and set them in the firmament of the heaven, to give light upon all the earth, and to rule over the day and the night, and divide the light from the darkness. 9. And God appointed the sun to be a great sign on the earth for days and for sabbaths and for months and for feasts and for years and for sabbaths of years and for jubilees and for all seasons of the years.

Retelling the account of the fourth day of creation, the author relies on Gen 1:14-19 as his base text, but modifies it according to his exegetical orientation.² Right at the start of the account of this day's creation he supplements the biblical account by specifying the "lights" in Gen 1:14 as three kinds of heavenly bodies - "the sun and the moon and the stars". However, whereas in Genesis all the lights are assigned the role of "signs for seasons and for days and years", the sun is singled out in *Jub.* 2:9 as the

² G. J. Brooke, "Exegetical Strategies in Jubilees 1-2," in M. Albani, J. Frey, and A. Lange (ed.), *Studies in the Book of Jubilees* (Texte und Studien zum Antiken Judentum 65; Tübingen: Mohr Siebeck, 1997) 39-57.

sole appointed sign to perform this function. In addition the role of this great sign is even further elaborated with almost every single unit one can think of in time reckoning. The supreme role of the sun is accentuated in this *Jubilees* passage for no other heavenly bodies, neither the moon nor the stars, share this role as time regulator.

Another passage where the sun's role is highlighted is *Jub.* 4:21, a verse in a section about the disclosure of knowledge to Enoch by the angels.

And he was moreover with the angels of God these six jubilees of years, and they showed him everything which is on earth and in the heavens, the rule of the sun, and he wrote down everything.

In *Jubilees* Enoch is regarded as the first man who “wrote down the signs of heaven according to the order of their months in a book, that men might know the seasons of the years according to the order of their separate months.” (4:17) *Jub.* 4:21 discloses that Enoch was with the angels for six jubilees of years, and during this period he was shown all the knowledge on earth and in heavens which he then wrote down for the generations to come. Strangely the author singles out “the rule of the sun” from the things that were shown to Enoch, and attaches these words to “everything which is on earth and in the heavens”. This strange emphasis is no doubt intentional in order to highlight the central role of the sun in the midst of the revealed knowledge.³

The three passages together demonstrate explicitly that *Jubilees* champions a “solar calendar” with 364-day a year. Although strictly speaking it is not exactly a calendar which complies to the astronomical cycle, undoubtedly it is guided by the rule of the sun, at least in the mind of the author. Whatever calendar *Jubilees* is

³ Charles sees a close connection between *Jub.* 4:17-23 and the Ethiopic Enoch. Among other parallels of the passage with the various parts of the Enochic literature, he links “the rule of the sun” (v. 21) with 82:13-20 of the *Astronomical Book*. (Charles, *The Book of Jubilees*, 36-37, note on 4:17-23) If the link between the books is justified, then the singling out of the rule of the sun in *Jubilees* is even more striking for in the *Astronomical Book* both the rules for the sun and the moon are clearly set out. Choosing to mention only the rule of the sun but not that of the moon is obviously an intentional preference to play down the role of the moon in the area of time reckoning.

opposing in the calendrical controversy one thing is certain and that is that the opposing calendar must have been one which took account of the lunar cycle in its reckoning system. The anti-lunar polemic is so obvious and vehement in *Jubilees* that it seems that no lunar reckoning of any kind could be tolerated by the book.

Status of the Lunar Cycle in 1 Enoch

In *1 Enoch* calendrical information mainly comes from the *Astronomical Book*, which provides a very different picture from *Jubilees* with regards to observance of the moon. The *Astronomical Book* is not a coherent and consistent work but a compilation of various treatises,⁴ so it is difficult to summarise its attitude towards the moon generally. However, a glance at the content of the book will suffice to give an impression of how important the moon and its circuit are in this collection of astronomical calculation.

Summary of the Contents of Ch. 72 to 82⁵

(Italics mine)

- First version: 72 to 76 (with 74 probably being an intrusion)
 72,2-5: Gates and Windows; winds drive the chariot of the sun (cf. 73,2 and also 18,4)
 6-36: length of daylight, M:m = 12:6; year of $4 \cdot 91^d = 364^d$
 37: *brightness and size of sun and moon* (cf. 73,3; 78,3,4)
 73,1-3: *winds drive the chariot of the moon* (cf. 72, 5); *brightness of sun and moon* (cf. 72,37; 78, 4)
 4-8: *increase of the area of illumination and of brightness of the moon from day 1 to day 14 (incomplete), first visibility on the preceding day 30 (i.e. after a hollow month)*
 74,1-4: *illumination of the moon during 15 days (i.e. for a full month)*
 5-9: *Gates and moon rise (incomplete)*
 10-16: *garbled description of an octaeteris*
 75,1-7: stars ('thousands') and seasons (cf. 82,4-20)
 8,9: circumpolar stars
 76,1-13: the 12 gates of the winds and their qualities (cf. the short version 33 to 36)
 14: concluding words to Methuselah (cf. 79,1)

⁴ For comments on the composition of the *Astronomical Book* see the introduction to these chapters in Charles, *The Book of Enoch*, 147-150.

⁵ Extract from Neugebauer, "The 'Astronomical' Chapters", 388.

Second version: 77 to 79,1

- 77: mythical geography
- 78,1: two-division of the year (cf. 78,15,16; 79,4,5)
- 2-5: lunar phases; size and brightness of sun and moon (cf. 72,33-37); Gates
- 6-14: lunar visibility, waning moon; hollow and full months (cf. 73,4-8 and 74,1-4)
- 15,16: two-division of the lunar year (cf. 78,1; 79,4,5)
- 17: visibility of the moon during night and daytime
- 79,1: concluding words to Methuselah (cf. 76,14)

Additional Fragments: 79,2 to 80,1; 80,4-20 (80,2 to 82,3 intrusion: apocalyptic)

- 79,2,3: Gates and lunar phases
- 4,5: two-division of the Enoch-year (cf. 78,1, 15,16) and Enoch epact
- 6,80,1: concluding speech of Uriel
- 82,4-20: hierarchy of stars ('thousand'), their leaders during the Enoch year (cf. 75,1)

According to Neugebauer's analysis, the *Astronomical Book* consists of two major versions basically covering the same material, together with some other additional fragmentary pieces. In each of the three parts the moon plays a significant role. The lunar related material occupies nearly half of the current composition of the chapters. This material covers various aspects of the moon's appearance in the sky, such as the size and brightness of the moon, its changing phases, the gates where it sets and rises, the length of its cycle, and the length of the lunar year. Unfortunately, nearly every section of this material is either incomplete or corrupted or both, which makes any attempt to formulate a coherent picture of the rule of the moon in the *Astronomical Book* difficult.⁶ We may not be able to know exactly how the authors or compilers of this book understood the lunar cycle, but from the prominent role occupied by the moon in the book we can still be sure that the original authors of the book had no hesitation in taking into account the moon in their collection of knowledge about the rules of the heavenly bodies.

⁶ Charles' comment on the chronological system of these chapters as a whole is that it "is most perplexing. It does not in its present form present a consistent whole, and probably never did." (*The Book of Enoch*, 149) Neugebauer echoes this comment in his study by saying "The whole Enochian astronomy is clearly an *ad hoc* construction and not the result of a common semitic tradition." ("The 'Astronomical' Chapters", 388) On various occasions the corruption of the lunar related material actually forces Neugebauer to give up the attempt to make sense of what the text is intended to say. For examples, see his notes on 74:10-17; 78:6-9; 79:3,4.

Pseudepigraphal Impacts on the Perception of the Qumran Calendrical Documents' Lunar Material

The sharp contrast between *Jubilees* and *1 Enoch* on lunar reckoning poses a question for the interpretation of the lunar material found in the Qumran Scrolls: where do the Qumran documents stand?⁷ Do they follow the teaching of *Jubilees* in playing down the role of the moon or do they agree with *1 Enoch* in embracing the moon and its circuit as an important part of the calendrical system? The polarisation of views in the two pseudepigraphal books seems to leave no possible middle ground for the students of the 364-day calendar to locate the later discovered material.

At an early stage the attention of Qumran calendrical scholarship was aroused by the connection with the other early known sources of the calendar. The differences mattered less than the common features. Most studies at this stage identified the calendar found in Qumran as similar, if not identical, to the one in *Jubilees* and *1 Enoch*.⁸ The consensus of view in answering this fundamental question gradually moved the scholarly interest to other aspects of the calendar. Consequently, the role of the lunar cycle in the various sources of the calendar has also gradually moved to the centre of study. As more material of the Qumran Scrolls is released by the editors the number of scrolls related to the lunar cycle rises.⁹ These scrolls impose a reality of divergence that can no longer be ignored by students of the Qumran calendar: So how do these lately discovered scrolls relate to the pseudepigraphal books with regard to their polarised views on the lunar cycle?

⁷ In turn one can say that the discovery of lunar calculation in the Qumran calendrical texts reopens the case for the understanding of the calendar in the Pseudepigrapha. For example, Bickerman has, on this issue, called for "a fresh investigation" of the "problem of 'Enochic' calendars and of the calendary practice of the Dead Sea Scrolls sectarians." (E. J. Bickerman, "Calendars and Chronology," in W. D. Davies and L. Finkelstein (ed.), *The Cambridge History of Judaism* (vol. 1, Cambridge: Cambridge University Press, 1984) 60-69, 68, note 3)

⁸ For reference to scholars who believe that the Qumran calendar is convincingly similar, if not identical, to that found in *Jubilees* and *Enoch* see Callaway, "The 364-day Calendar", 19-20, note 2.

⁹ Scrolls read by editors with lunar connections are:

4Q208-209 (Milik), 4Q317 (Milik), 4Q318 (Greenfield and Sokoloff), 4Q319 (Milik), 4Q320 (Milik), 4Q321 (Milik), 4Q321a (Milik), and Q503 (Baillet).

A common scholarly view is to set the Qumran Scrolls alongside *1 Enoch* in opposition to *Jubilees*.¹⁰ Albani's approach to the lunar material in these books is exemplary of this view.¹¹ Focusing on the progress of development, Albani sees the 364-day calendar not as a short lived sectarian innovation, but rather as a calendrical tradition with much wider influence and a longer history. Albani holds that the calendar was formulated during the Babylonian Exile. Under the influence of Mesopotamian astronomical science and their desire to pay tribute to the sacred sabbath cycle the exilic Jews generated this peculiar calendrical system of their own. At an early stage, the different cycles were idealised and schematised to formulate a perfect system which was only theoretical and without practical value. In this idealised system the lunar cycle was regarded as a confirmation of the perfection of the universe. The two most important calendrical cycles, solar and lunar, were harmonised in a three-year period, which was then extended to cover the priestly roster over six years, and further to include the sabbatical year cycle in 294 years. In this respect the moon was regarded as an important sign and the fundamental controller of the calendar which ensured that the years and the other longer cycles were matched perfectly.¹² Albani understands all the 364-day calendrical texts bearing lunar reckoning as the products of this earlier stage.¹³ At a later stage, when the

¹⁰ One scholar, VanderKam, taking this approach, states the conclusion of his short book *Calendars in the Dead Sea Scrolls: Measuring Time* (Literature of the Dead Sea Scrolls; London: Routledge, 1998), "But the cave 4 calendrical documents just as clearly set forth a schematic, 354-day lunar arrangement that was brought into alignment with the solar calendar by regular intercalations. There is no clear indication in the texts that the lunar system was considered inferior to the solar year, as was the case in *Jubilees*. In this respect the Qumran calendars are more in line with the teachings in *1 Enoch* than with that which *Jubilees* has to say about the subject." (111)

¹¹ Albani has published various books and articles on the astronomical and calendrical reckoning in the Books of Enoch and in the Qumran scrolls. For his view of the lunar cycle in these books see specially "Die lunaren Zyklen".

¹² Albani interprets *1 Enoch* 74:12 "the moon makes all the year exact" as an apologetic statement emphasising the role of the moon for regulating the years.

¹³ These texts include the *Astronomical Book*, 4QEnastr, 4QPhases of the Moon, 4QOtot, 4QCal Doc A and B.

people who owned this schematic calendar decided to put it into practice they faced the problem of the discrepancy between their idealised cycles and the actual ones. To turn it into a practical calendar, Albani argues, the 364-day year had to be adjusted in some way to match the real solar year. In doing so the simple three-year correlation between the theoretical lunar cycle and the 364-day year could no longer be held together. People who had campaigned for putting the calendar into practical use now found the rigid co-ordination a great hindrance to their aim. To apply their favoured calendar to daily life they no longer saw the lunar cycle as an indispensable part of their idealised world but rather as a stumbling block leading people astray with regard to correct time reckoning. From this came the stance of the anti-lunar polemic in *Jubilees*. It is this perception of the development of the calendar that leads Albani to put *Jubilees* in strict opposition to both *I Enoch* and the lunar related scrolls from Qumran. He believes that the polemic is not a conflict between the 364-day calendar and the outside world but a strife within the calendrical tradition itself.¹⁴

Not every one agrees with this characterisation of the *Jubilees* versus the lunar related books. Another scholarly view is to see the difference as a divergence of the degree of acceptance held by the different authors towards the prevailing Jewish lunisolar calendar of the time. Baumgarten believes that there was a change in attitude towards the lunisolar calendar among those who followed the 364-day calendar.¹⁵ At first the group which invented the 364-day year was quite accommodating to other calendrical systems operating outside its circle. It was under this more relaxed atmosphere that the *Astronomical Book* and the lunar related Qumran scrolls were conceived. The nature of the lunar element in these texts was to co-ordinate the 364-day calendar with the prevailing lunisolar calendar. Behind this co-ordination “[t]he preferred rationale was that the lunar year was being used in contemporary practice

¹⁴ A similar view of separating the texts with 364-day calendrical tradition into two opposite camp disputing over the issue of lunar reckoning is also held by Snyder. (“Mishmarot Calendars”, 343-350)

¹⁵ For Baumgarten’s view on the attitude towards lunar reckoning in the development of the 364-day calendar see especially J. M. Baumgarten, “4Q503 (Daily Prayers) and the Lunar Calendar,” *Revue de Qumrân* 12 (1986) 399-407.

for secular purposes and could therefore not be totally ignored.”¹⁶ At this time, the group did not only take note of the calendar of the wider society but even tried hard to harmonise it with their own. It is only in a later stage that the co-ordination with the lunisolar calendar was repudiated, a change which is demonstrated in *Jubilees*. The extreme position taken by *Jubilees* in rejecting the lunar reckoning is a polemic against the calendar used by other Jews, as well as a reaction to the compromising stance taken by the earlier works of the same calendrical tradition.

An alternative view similar to this one but offering a different role for the 364-day calendar in history is the one held by VanderKam.¹⁷ Following Jaubert’s proposal, VanderKam understands the 364-day calendar as the Jewish official cultic calendar operating in the Second Temple in its early centuries. While the calendar was in control of the Temple cult, its adherents were willing to allow co-ordination with the secular lunisolar calendar. This brought about books such as *I Enoch* and the lunar Qumran Calendrical Documents. However, when the calendar was displaced from the Temple by the lunisolar calendar under the influence of Hellenisation, the vehement condemnation of the lunar calendar arose among the resolute devotees of the ancient calendar. This produced books like *Jubilees*. This change in attitude towards the lunar calendar in *Jubilees* and *I Enoch* is taken by VanderKam as circumstantial evidence that a calendrical change - from the 364-day calendar to the lunisolar calendar - took place among the Jews in the mid-second century BCE.¹⁸

There are also other views which see no particular contradiction on the issue of lunar reckoning existing among the 364-day calendrical texts. One of the scholars who prefers to see the books as a harmonious collection is Talmon. As a veteran of Qumran calendrical studies, Talmon has long perceived that there was a conflict

¹⁶ Baumgarten, “4Q503”, 405.

¹⁷ For VanderKam’s view on calendrical change during the Second Temple period see “The Origin,” and “Calendrical Texts and the Origins of the Dead Sea Scroll Community,” in M. O. Wise, N. Golb, J. J. Collins, and D. G. Pardee (ed.), *Methods of Investigation of the Dead Sea Scrolls and the Khirbet Qumran Site: Present Realities and Future Prospects* (Annals of the New York Academy of Sciences 722; New York: New York Academy of Sciences, 1994) 371-389.

¹⁸ J. C. VanderKam, “2 Macc. 6:7a and Calendrical Change in Jerusalem,” *Journal for the Study of Judaism in the Persian, Hellenistic and Roman Period* 12 (1981) 1-23, 57, note 20.

between the people of the Qumran Scrolls and the Jewish official authority over the matter of the calendar, and thinks that all the scrolls found at Qumran are united in upholding a 364-day solar calendar. Even between *Jubilees* and *I Enoch*, Talmon sees no disagreement over their anti-lunar-reckoning attitude. Although the lunar calendar is discussed at length in *I Enoch*, it is described in a matter of fact manner that does not constitute proof of the book's approval of it. As a whole the two books both reckon the 364-day calendar and they both uphold the status of the sun over that of the moon.¹⁹ With regard to the Qumran Scrolls Talmon holds the same view that they also exalt the status of the sun over that of the moon. His view on the lunar element of the Qumran Scrolls is best summarised in the abstract of one of his preliminary works on the Calendrical Documents jointly published with Knohl.

It should be stressed that calendrical documents like the one published here are not intended to provide overall "synchronization table" between the solar and the lunar year, as is sometimes maintained. Rather, the specification of the moon's monthly "dark" phases and their equivalent dates in the solar calendar are intended to provide the *yahad* members with a means for avoiding, to the best of their ability, the "negative" dates in the moon's revolution that spell evil and potential disaster.²⁰

In Talmon's eyes the calculation of the lunar cycle should not be regarded as due respect being paid by the Qumran community to the moon, but rather as a means of avoiding evil. In these texts the enumeration of the festivals and the important days of the solar calendar shows that the sun is regarded as the source of joy and light, whereas the counting of the dark periods of the lunar cycle indicates that the moon is regarded as the source of evil and darkness. In this sense the Calendrical Documents

¹⁹ S. Talmon, "The Calendar of the Covenanters of the Judean Desert," *The World of Qumran from Within* (Leiden; Jerusalem: Brill; Magnes, 1989) 147-185, 167-171. Talmon believes that there is no polemic between these books but rather between them and the rabbinic literature which upholds the lunar supremacy.

²⁰ Talmon and Knohl, "Mišmarot B^b (4Q321^a)", 409.

are in line with the pseudepigraphal books in condemning the followers of the lunar calendar,²¹ and the anti-lunar polemic exists among all the texts which follow the 364-day calendar.²²

Another approach to see the various texts containing the 364-day calendar as a harmonious collection is put forward by Beckwith. Presuming that the people at Qumran were Essenes, Beckwith actually calls the calendar of the Qumran Scrolls the “Essene Calendar”.²³ Although he classifies some of the scrolls as “pre-Essene”,²⁴ Beckwith still regards the whole cache as from a consistent school of thought, and finds no difficulty in putting together material from various books in order to formulate an overall idea about the calendar of these people. Beckwith’s view on the development of the 364-day calendar is that it was formulated by the Essenes or their forerunners based on their own biblical interpretation and under the influence of the surrounding culture.²⁵ In the first place the newly created calendar was meant to be an

²¹ Talmon and Knohl, “Mšmarot B^a, 4Q321”, 299-300.

²² Other than in the Calendrical Documents Talmon also finds anti-lunar polemics in other Qumran writings to support his idea. See S. Talmon, “Anti-Lunar-Calendar Polemics in Covenanters’ Writings,” in M. Becker and W. Fenske (ed.), *Das Ende der Tage und die Gegenwart des Heils. Begegnungen mit dem Neuen Testament und seiner Umwelt. Festschrift für Heinz-Wolfgang Kuhn zum 65. Geburtstag* (Leiden: Brill, 1999) 29-40. The only document which Talmon cannot fit into his anti-lunar polemic view is 4Q503, the Daily Prayers. The explanation given by Talmon for the existence of such a text with lunar reverence is that “the liturgical composition 4Q503 mirrors the contemplation of cosmic phenomena irrespective of calendrical matters. It gives expression to the worshiper’s praise of God’s works of creation, the sun and the moon, and to his admiration of the divine determination of the great luminaries’ respective revolutions.” (“Mšmarot B^a, 4Q321”, 301)

²³ R. T. Beckwith, “The Essene Calendar and the Moon: A Reconsideration,” *Revue de Qumrân* 15 (1992) 457-466. As early as 1957, the same term had already been used by Milik to call the calendar in the Mishmarot texts. (“Le travail”, 25)

²⁴ R. T. Beckwith, “The Earliest Enoch Literature and its Calendar: Marks of their Origin, Date and Motivation,” *Revue de Qumrân* 10 (1981) 365-403, 365.

²⁵ Beckwith sees the influence as coming from two surrounding calendars, the Pentecontad Calendar and the Greek Calendar. (“The Earliest Enoch Literature and its Calendar: Marks of their Origin, Date and Motivation”, 383)

honest representation of the astronomical cycles. Only after some time when the calendrical dates began to move away from the natural phenomena was the discrepancy between the two realised. However, instead of adjusting the calendar to bring it back into alignment the Essenes chose to hang on to their highly systematic calendar and resorted to giving theological explanations for the induced discrepancy.²⁶ In respect of lunar reckoning Beckwith regards this Essene calendar as fundamentally a solar one but thinks that it did not totally ignore the moon either. "In view of *Gen.* 1, 14-16 and *Pss.* 89, 35-37; 104, 19, and also of the relation between the biblical words *yerah* (month) and *yareah* (moon), its champions had no option but to give the moon some degree of attention."²⁷ Yet the reckoning they offered for the lunar cycle was also a schematic one without true alignment with the real cycle. Beckwith recognises that:

the deepest difference between the Essene calendar and the Pharisaic was not that the Essene calendar was mainly controlled by the sun and the Pharisaic by the moon, though this was the superficial difference. The deepest difference was that the Essene calendar was controlled by calculation and the Pharisaic by observation.²⁸

Thus Beckwith's understanding of the well-known polemic passage in *Jub.* 6 is that it is against those who based their calendar on observation of the moon. It is not objecting to the incorporation of the lunar reckoning into the calendrical system but rather to the formulation of the calendar based on actual observation. Therefore there exists no contradiction between the schematic lunar reckoning in *1 Enoch* and the Qumran Calendrical Documents and the rejection of observation in *Jubilees*.

²⁶ Beckwith, "The Earliest Enoch Literature and its Calendar: Marks of their Origin, Date and Motivation", 385-387; Beckwith, "Modern Attempt to Reconcile the Qumran Calendar with the True Solar Year", 392-394.

²⁷ Beckwith, "The Essene Calendar", 458.

²⁸ Beckwith, "The Essene Calendar", 459.

This brief review on how the lunar material found in the Qumran Scrolls is related to the pseudepigraphal books shows, on the one hand, the significance of the lunar issue in the understanding of the history of the calendar and, on the other hand, the diversity of the scholarly views in this respect. Right from the outset the study of the lunar material of the Qumran Scrolls has been under the influence of the pseudepigraphal books and information has been combined from these different sources. However, in order to understand properly the lunar reckoning in the Calendrical Documents it is necessary to isolate them from the other books so that an in-depth and unbiased picture based on the evidence found in these documents alone can be formulated. It is only when such a clear picture is formed that its comparison with the other sources of the 364-day calendar will be able to reveal the true relationship between them. Hence, the examination of the lunar material of the Calendrical Documents will proceed in three steps:

1. To identify the lunar related sections in the Calendrical Documents and to check for the validity of their lunar correlation.
2. Based on information from those confirmed lunar sections to formulate an understanding of their lunar reckoning.
3. To compare the understanding formulated in step 2 with the lunar material in *Jubilees* and *1 Enoch* to review their agreements and disagreements.

LUNAR RELATED SECTIONS OF THE QUMRAN CALENDRICAL DOCUMENTS

Not every Qumran Calendrical Document has its enumeration connected with the lunar cycle. Among all the documents only seven manuscripts have been suggested as having lunar correlation in one way or another. They are: 4Q317, 4Q319, 4Q320, 4Q321, 4Q321a, 4Q322, and 4Q323. Starting from the most obvious to the more obscure, these manuscripts will be inspected one by one firstly to see how they have been proposed to be related to the lunar cycle, and secondly to examine the soundness of these proposals.

This manuscript was first partially published by Milik in 1976,²⁹ when it was introduced with its old title “4QAstrCrypt” which gave no indication of its lunar relation. However, about its content Milik stated, “In it the phases of the moon are described, on a scale of fourteenths of the area of the full moon, for the successive days of the solar year of 364 days.” Thus ever since this manuscript has been more commonly known as “4QPhases of the Moon”.

As a matter of fact there is no explicit wording found in its fragments which confirms that the text is talking about the moon. The text contains many brief calendrical entries and it is difficult with each of these entries on its own to tell what it is about. Take an entry cited by Milik as an example: “On the fifth (day) of this (month) it is covered (up to) twelve (fourteenths of its surface); and so it enters the day.” If the supplementary words in the brackets were taken away the remaining words would not make much sense. However, the lack of explicit wording on the subject matter does not put one off from realising that the content of the text as a daily account of the phases of the moon when the surviving entries are read together as a whole. A few hints help to confirm that the text is about the lunar phase change.

1. The fuller entries

Other than the brief entries the text every now and then gives fuller descriptions in some entries, which provide more information on the content of the text. One of these fuller entries (1 ii 7-10) is cited as an example:

7. On the eighth of it, [it rules its light for a day in the midst of]
8. the sky abov[e. <fourteen and a half> And when the sun comes]
9. its light [ceases] to be covered, [and thus it begins to be revealed]
10. on the first of the week.

²⁹ Milik, *The Book of Enoch*, 68-69.

The passage supplies a few important clues for the understanding of the text. Firstly, “in the midst of the sky above” (lines 7-8) tells us that the text is about something happening in the sky. Secondly, “when the sun comes” (line 8) discloses that it is not concerned with the sun but rather something appearing besides it. Thirdly, it is about the covering and revealing of “light” (lines 7 and 9).

2. Fuller entries as turning points of brief entries

The brief entries are all recorded with regular formulas, which can be grouped together into two very similar styles. These formulas are:

On a certain number of it, it reveals a certain number, and so it enters the night.
On a certain number of it, it covers a certain number, and so it enters the day.

One of the formulaic styles is always used in successive entries until it reaches a fuller entry, then after the fuller entry the other style will be used continuously in the subsequent entries until another fuller entry is reached when the change over of style will again take place.³⁰ This changing pattern of formulaic styles indicates that the fuller entries are the turning points of a certain process recorded in the text.

3. The “step” changes in lines between the fuller entries

From the description of the fuller entries it is known that what is being described in the brief entries as being revealed or covered is the light of something in the sky. The amount of this revealed or covered light changes in each entry and the change is always in an increasing order of one unit at a time.³¹

4. Fourteen steps of light change between the fuller entries

The amount of revealed or covered light always starts with one part in the first entry after a fuller entry,³² and ends with either thirteen³³ or fourteen³⁴ parts in the

³⁰ The change over of styles at the fuller entries is best illustrated in 1 ii 1-32, but extant evidence for this changing pattern is in fragment 2.

³¹ Extant evidence for this one part increment is preserved most vividly in 2:10-13.

³² See 1 ii 11, 2:10, and 4:9.

³³ In 1 ii 26, the number is a reconstruction but it is confirmed by the order sequence and the number of entries between the lines.

last entry before the next fuller entry. With each entry representing a day, as demonstrated by the number in the front of the entries, this means that there are always either thirteen or fourteen days between the turning points of this process.

At this point there should be no more doubt about what the text is recording: this can only be the waning and waxing process of the moon appearing in the night sky. The daily amount of light shown on the moon's face is recorded in each entry. The fuller entries represent the days when the moon reaches the turning points of its phase change, that is the full moon and the dark moon. Between these turning points the moon either reveals more and more of its light or covers it up gradually. For thirteen or fourteen days the moon changes from one extreme phase to the other, and altogether it takes about twenty-nine to thirty days to complete a cycle. The interpretation of the text - "in it the phases of the moon are described" - suggested by Milik is vividly attested by the evidence recovered in the fragments of the manuscript.

4Q320

The earliest disclosure of this manuscript was in Milik's 1956 preliminary report, where its lunar characteristic was stated.

les Mismarot de 4Q présentent une concordance entre le rôle sacerdotal hebdomadaire, le calendrier lunaire à mois de 29 et 30 jours alternativement et l'année de 364 jours. Voici un exemple: *b6 bYh̄zq' l l29 b22 l's̄ty 'sr*; à interpréter comme suit: "le vendredi de (la semaine de) Yehizqiel correspond au 29 (du mois lunaire) et tombe le 22 du 11^e mois (du calendrier "essénien").³⁵

The example quoted by Milik is from 4Q320 1 ii 2. The section containing this line covers the three columns of fragment 1 of the manuscript, and Milik sees the section

³⁴ See 2:6, 3:7.

³⁵ Milik, "Le travail", 25.

as a synchronising table between (1) the weekly roster of the priestly services, (2) the lunar calendar of alternating twenty-nine-day and thirty-day months, and (3) the 364-day year. Not everyone who has subsequently studied this section accepts Milik's interpretation,³⁶ but they all agree in principle that it is somehow concerned with the lunar cycle.

The word "moon" is not found in the extant fragments of 4Q320, and there is no explicit reference in its surviving texts that the lunar cycle is related here, but this can be inferred. The first hint comes from the introductory entry at the beginning of the section (1 i 1-5).³⁷

1.]to show it from the east.
2. [And] to cause it to shine [in] the middle of the sky, on the foundation of
3. [the firmamen]t, from evening till morning on the 4 of the week of
4. [sons of G]amul, *vacat* for the first month in the
5. [firs]t year;

The wording in the passage is clear enough to indicate that it refers to the appearance of some heavenly body, but which one? The phrase "from evening till morning" (line 3) defines something that can only be seen at night, therefore the sun is excluded from the possibilities. It is unlikely to mean the stars either for otherwise the suffixed pronouns of the verbs in lines 1 and 2 would be plural. Thus the moon remains as the most likely candidate.

This speculation on the subject of the introductory entry is supported by the data in the subsequent entries of the section. There are three elements in each entry: (1) a weekday according to the priestly roster, (2) a number with a preposition ל, and

³⁶ For example, Wacholder and Abegg believe that this section "plots the Full Moon from its formation on the fourth day of creation week through two 3 year cycles, or in other words, one 6 year priestly rotation." (*Preliminary Edition*, 60).

³⁷ This passage is crucial for the understanding of the lunar cycle in the Qumran texts and will be discussed in more detail in the later section. At the moment the concern is only with confirming its lunar relationship.

(3) a date with both the order of day and month. Milik takes the second element as a date on the lunar calendar. Whether this is a correct interpretation or not will be discussed later, but at present it is sufficient to note that whenever this number is extant in the fragments it always appears to be either twenty-nine or thirty. When this number is compared to the information provided in the other two elements, it matches with the duration separating the dates in successive entries.³⁸ In other words, if each entry is a record of the recurrence of a certain event, this number is representing the duration between these recurrences. From a calendrical or astronomical perspective an event that repeats in either twenty-nine or thirty days is likely to be related to the lunar months or the lunar cycle. This confirms the lunar correlation of the section in 4Q320 fragment 1.

4Q321 and 321a

These two manuscripts are considered copies of the same text. The better preserved manuscript (4Q321) shows that the work has two sections, and only text from the first section is found in the other manuscript (4Q321a). A brief note on the first section of the work is provided by Milik in his book *Ten Years of Discovery in the Wilderness of Judaea*,

Nevertheless, in one of their synchronistic tables, in addition to the correspondence between the day of their solar calendar and the first day of their lunar month they also note the day of the solar month on which the *new* moon falls; this correspondence is called *dauqah* or *duqyah*.³⁹

Although no reference to the text is given by Milik, the words “*dauqah* or *duqyah*” make it clear that he is referring to the first section of 4Q321 and 4Q321a. Milik’s

³⁸ For the comparison of this number with the dates in the entries see table and discussion in pages 240-241.

³⁹ Milik, *Ten Years*, 152, note 5.

understanding of the text is that it is a “synchronistic table” providing correspondence between the solar and the lunar calendar.

The editorial work of these manuscripts has passed from Milik to Talmon and Knohl who have produced preliminary reports on these manuscripts in two separate articles.⁴⁰ Talmon and Knohl rejected Milik’s idea that the text is a synchronistic table of two calendars, but they still agreed that it is lunar correlated. What they see in the text is a “specification of the moon’s monthly ‘dark’ phases and their equivalent dates in the solar calendar”.⁴¹ The text has generated great debate on its interpretation, especially on the meaning of the word *duqah*, but its lunar correlation has never been doubted. Despite the undisputed consensus held by scholars on the text’s lunar connection, it is still necessary to see whether this agreement is supported by the text’s extant evidence.

There is no explicit or implicit statement in the writings of the manuscripts’ fragments that hints at its lunar relationship. All the extant texts of this section in both manuscripts belong to entries which follow a standard formula: “On *a certain day* of *a certain priestly course* on *a certain day* of *a certain month*, and *duqah* on *a certain day* of *a certain priestly course* on *a certain day* of it”. In this case what can be found with the writing are only dates (dates according to the priestly roster and dates according to day and month) and the word *duqah*. This word does not help one in understanding the content of the text because its meaning is dubious. So what the text so meticulously recounts cannot actually be directly known from the extant writings in the fragments.

The possible hint from the extant text to support its lunar correlation comes from the periods of separation between the recording dates. Based on the data of entries that can be confirmed by the extant writing in the fragments, the following successive dates for the two parts of the entries can be ascertained:

⁴⁰ Talmon and Knohl, “Mišmarot B^a, 4Q321” and “Mišmarot B^b (4Q321^a)”.

⁴¹ Talmon and Knohl, “Mišmarot B^b (4Q321^a)”, 409.

Extant successive dates for the first part of the entries

Weekday	Priestly course	Year	Month	Day	Separating Duration (calculated)
2	Abijah	1st	25	8	29
3	Jakim		24	9	30
5	Immer		23	10	29
6	Jehezkel		22	11	30
1	Jehoiarib		22	12	29
2	Malchijah	2nd	20	1	30
4	Jeshua		20	2	
sabbath	Hezir	6th	7	6	29
1	Jachin		5	7	30
3	Jehoiarib		5	8	29
4	Malchijah		4	9	30
6	Jeshua		3	10	

Data from 4Q320 1 i 1-7 and 2 i 1-5 with extant data in bold

Extant successive dates for the second (*duqah*) part of the entries

Weekday	Priestly course	Year	Month	Day	Separating Duration (calculated)
4	Jachin	2nd	29	10	30
6	Jehoiarib		29	11	29
sabbath	Mijamin		28	12	
5	Harim	6th	21	8	30
sabbath	Abijah		21	9	29
1	Jakim		19	10	30
3	Immer		19	11	29
4	Jehezkel		18	12	

Data from 4Q320 1 ii 6-8 and 2 i 3-7 with extant data in bold

Calculating from this extant data the duration of separation between the two successive dates of the same event is always either twenty-nine or thirty days. If the text is recording the recurrences of the events, then the recurring period for these events is either twenty-nine or thirty days. Therefore, these events are most likely to be connected with the cyclic phase change of the moon.

The section of this manuscript which is suggested to be lunar related is from column 4 to 6 of fragment 1. Due to the repeated occurrences of the word אוֹת in this section, it is also known as the *Otot*-text, which also gives the entire manuscript its title, 4QOtot. When the text was introduced to the public for the first time Milik stated that, “In the cycle of the seven jubilees which is described in 4QS^b the ‘signs’ for the successive triennial periods are enumerated, for example $\text{’ô}t\ G^e mûl$ and $\text{’ô}t\ S^e kanyah$.”⁴² No specification was given for why the signs of successive triennial periods are enumerated, but a few lines before in a brief description of “the calendars of 4Q” Milik remarks

The priestly roster is spread over six years, and this sexennial cycle reflects a desire to synchronize the sect’s religious calendar ... with the lunisolar calendar ... Accordingly, the two calendars synchronize every three years ($364 \times 3 = 354 \times 3 + 30$).⁴³

Are these two three-year periods meant to be understood together? If so, then Milik’s understanding of the *Otot*-text is a lunar one: it is an enumeration of the period of synchronism between the solar and the lunisolar calendars. However, almost the entire section is a recitation of a very simple formula which contains three elements: (1) a name, either Gamul or Shecaniah, (2) a word “sign”, and (3) a yearly order. This repeating unit gives no indication whatsoever of its lunar relation which opens up the possibility for other interpretations. In this manner the lunar relation of the *Otot*-text is questioned by Glessmer, who asks,

Is the distance of ‘signs’ every fourth year connected with special ‘lunar events’, i.e., ‘signs’ in an astronomical sense? ... Or is it adequate to suppose a non-lunar re-interpretation, which uses the special counting of the ‘signs in

⁴² Milik, *The Book of Enoch*, 62.

⁴³ Milik, *The Book of Enoch*, 62.

the ^emita' in a sense of intercalation for a 364-day-year against the tropical year?⁴⁴

Can the lunar context of this text be confirmed by its extant evidence? Not exactly, but there are still hints to suggest that it is so. Before the recitation of the repeating formula, a couple of badly mutilated introductory lines (1 iv 10-11) are found, which may be able to elucidate, or at least to delimit, the context of the subsequent enumeration.

10. [] its light in the fourth (day) of the we[ek]

11. [the] creation on the fourth (day) of G[amul (is) a sign;

Had this introduction been better preserved it could probably tell us what the “sign” in the subsequent enumeration was all about. Unfortunately the damaged condition denies us a firm answer. However, the wording in these lines still hints at its connection. Firstly, the “sign” is connected with “the creation on the fourth day of the week”. According to Gen 1:14, what were made on the fourth day of the creation week were the two great lights - the sun and the moon - and the stars. On this day God assigned these lights as for signs of seasons, days and years. So the “sign” in this text is most likely to be related to these heavenly bodies. Secondly, it is concerned with “the light” (אורה) of something appearing on this day. In Gen 1:17, it says,

⁴⁴ U. Glessmer, “Investigation of the Otot-text (4Q319) and Questions about Methodology,” in M. O. Wise, N. Golb, J. J. Collins, and D. G. Pardee (ed.), *Methods of Investigation of the Dead Sea Scrolls and the Khirbet Qumran Site: Present Realities and Future Prospects* (Annals of the New York Academy of Sciences 722; New York: New York Academy of Sciences, 1994) 429-440, 436. The same question on the possible alternatives for the interpretation of the Otot-texts is again raised in Glessmer, “The Otot-Texts”, 146, where the alternatives can be summarised as “synchronism” against “intercalation”. Obviously Glessmer’s choice is the latter as he stated “If a moon-context seems not to be probable for 4QOtot, a model of intercalation seems to be the most plausible explanation for the hitherto unparalleled Otot-element in col. IV10-VI19.” (“The Otot-Texts”, 147) However no specific explanations are given for why he thinks that a lunar context is not probable for 4QOtot other than saying, “no reference to the moon is discernible in the fragments [of 4QOtot]”.

“God set them [the heavenly bodies] in the dome of sky to give light (לְדָאוֹר) upon the earth”. Thus the light in line 10 is probably also referring to the light of a heavenly body. From these we can infer that the “sign” is related to the function or the appearance of a heavenly body on the fourth day of the creation week. So, based on these introductory lines the only interpretation that is supported by the evidence of the extant texts is one with an “astronomical sense”.

The evidence from the introductory lines defines the context of the text as related to the heavenly bodies, but the scope cannot be further narrowed down to a more specific body by information from this text alone. To confirm its correlation with the lunar cycle support from another Calendrical Document is needed. In order that information can be transferred from one text to another there must be a secure affinity between the two. Such an affinity can be proved as existing between the manuscripts 4Q319 and 4Q320 based on their resemblance in the following points:

1. The priestly roster

Both manuscripts employ the priestly roster as a tool for marking dates and events. This characteristic feature guarantees the identity of the structure of their underlying calendar.⁴⁵

2. Parallel sections

There are parallel sections in the two manuscripts. At least three parts of 4Q319 can be found paralleled in 4Q320.⁴⁶

4Q319	
VII 7-18 [fragment 2]	“leaders of the months” in the six-year-cycle // 4Q320 Calendars A (Mism A) frgm. 4 I
VII 18/19-VIII 19 [fragment 7-8]	“calendar of festivals” in the six-year-cycle // 4Q320 Calendars A (Mism A) frgm. 4 III-VI
IX 4-8 [the concluding passage]	“fundamental time-structure” // 4Q320 Calendars A (Mism A) frgm. 4 II

⁴⁵ See the discussion on the Priestly-Courses feature of the Qumran Calendrical Documents in the previous chapter in pages 169-173.

⁴⁶ The table is a part extract from Glessmer, “The Otot-Texts”, 147. Although Glessmer also notices that there are parallels between 4Q319 and 4Q320, he denies 4Q319 with any lunar correlation and argues “that no reference to the moon is discernible in the fragments and that nothing like this is to be expected in the above arrangement of columns [of 4QOtot].”

The original column and line numbers are directly quoted from Glessmer’s table; their corresponding fragment numbers given in this thesis are provided in square brackets.

3. Common themes

Apart from the parallel sections similar wording is also found in both manuscripts which reflects that they hold some themes in common.

Theme on	4Q319	4Q320
creation	1 iv 11	2 i 2
light	1 iv 10	1 i 2
the fourth day of Gamul	1 iv 10-11; the concluding passage, line 8	1 i 3-4; 2 i 4-5; 4 ii 13-14
series of time units	the concluding passage, lines 4-7	4 ii 10-13

4. Sign as an enumerating unit

In 4Q319 “sign” is unquestionably the subject of enumeration in the entire *Otot*-section. Among all the other Calendrical Documents this characteristic of taking a sign as a counting unit is only found in 4Q320. In two very small fragments (fragments 5 and 7) the word “signs” is found, and in one of them the word is followed by a number written in numeric symbols, the same style as in the summary statements of the *Otot*-text. Although the exact content of these tiny fragments is not known, their resemblance with 4Q319 is remarkable,⁴⁷ which forms undeniable evidence for the close connection between the two manuscripts.⁴⁸

⁴⁷ In contrast, Glessmer sees “a difference in linguistic usage” between the “signs” found in the two manuscripts and suggests that they might refer to different things. (“Calendars in the Qumran Scrolls”, 263)

⁴⁸ Another technical term used by both manuscripts as a time reckoning unit may point to the same suggestion. The word שביטה, Release, is among the lists of fundamental time units in both manuscripts to stand for the period of seven years. In other Qumran scrolls the period is commonly referred to as “week of year” (cf. 1QS 10:7-8, CD 16 2:4, and in the preface of *Jubilees* and throughout its counting of years in terms of jubilees and weeks of years), but only in these manuscripts this seven-year period is referred to by a name which is connected with the biblical ordinance on the sabbatical year (cf. Lev 15 and 25).

The two manuscripts are certainly not exact copies of the same work and in most sections their objectives of enumeration are different, but their close resemblance is undeniable. We have learnt that the section in 4Q320 fragment 1 is lunar related and it covers a cycle of three years. With the resemblance of the two manuscripts in mind it is hard to image that a three-year co-ordination between the lunar cycle and the 364-day year is carefully formulated in one manuscript, while another three-year period which has nothing to do with the lunar cycle at all is enumerated in the other. The author's purpose for counting the three-year period against the seven-year release cycle in the *Otot*-text may still be a debatable question, but the lunar connection of the three-year period in the text is indisputable.

4Q322 and 4Q323

Milik in his 1957 preliminary report also mentioned a work which may have a lunar correlation.

Un ouvrage, représenté par deux mss. différents, mais malheureusement réduits à quelques petites parcelles, s'apparente au même groupe de Mismarot, mais avec des additions d'un intérêt exceptionnel. ... Mais occasionnellement se retrouvent la mention des mois babyloniens ("... neuf de Sebat" -... *šḥ lšbt*; "... de Marheswan" - *lmrhšwn*) et des événements historiques.⁴⁹

These two manuscripts turn out to be 4Q322 and 4Q323 with the quoted words from 2:2 and 4:5 respectively. There is no other indication that these manuscripts are lunar related other than the two month names. However, if the reading of these names is correct, then their lunar correlation is established. The names read by Milik are the Hebrew equivalents of two of the twelve Babylonian month names, which have been adopted by the Jews since the Exile until the present day. The Babylonian calendar, as well as its Jewish counterpart, was lunisolar with its months fixed on the sighting of

⁴⁹ Milik, "Le travail", 25-26.

the new moon. Thus the presence of Babylonian month names in these manuscripts would mean that in their texts the lunisolar calendar is somehow connected to their controlling calendar which is certainly the 364-day calendar. Nevertheless, the reading of the Babylonian month names is not entirely clear, and it is unsound to base on it a theory that the Babylonian/Jewish lunisolar calendar is co-ordinated in the Qumran Calendrical Documents.⁵⁰ To see why these readings are to be doubted it is necessary to look at the fragments containing these words.

In 4Q322 2:2 what remains in the line is “[יה] לשבט זה”. There is no problem with the reading of the surviving letters. The problem is rather with their interpretation. Does the word שבט necessarily mean the Babylonian month Shebat? Although most of the translations follow Milik’s suggestion in translating the line as “ninth of Shebat (month)”, it is not the only possibility. Wise has a different idea for this word, and in various studies he consistently translates the line as “on the fourth (day) of this course’s service”.⁵¹ The word שבט could mean the eleventh month of the Babylonian/Jewish calendar, but it more commonly means “rod, staff, club, sceptre, or tribe”.⁵² Therefore it is totally legitimate for Wise to take it to mean “tribe”, and hence to extend this meaning to refer it to the service of a priestly family.

Furthermore, the line does not need to be understood in a calendrical sense. To interpret the line in a calendrical sense, as both Milik and Wise do, appears to be compelling when one considers that it is found in one of the calendrically related texts. However, its oddity as a piece of calendrical information compared with others in the

⁵⁰ Talmon has commented on this issue in one of his work on the calendrical controversy where he states “The question of whether the Covenanters developed a system of synchronization of their solar with the Jewish lunar calendar remains open. While some scholars affirm that this was the case, I maintain that this affirmation derives from an inaccurate interpretation of data in Qumran calendrical texts.” (“Calendar Controversy in Ancient Judaism: The Case of the Community of the Renewed Covenant,” in D. W. Parry and E. Ulrich (ed.), *The Provo International Conference on the Dead Sea Scrolls: Technological Innovations, New Texts, and Reformulated Issues* (Studies on the Texts of the Desert of Judah 30; Leiden: Brill, 1999) 379-395, 387.)

⁵¹ See the translation in Wise, *Thunder in Gemini*, 191; Eisenman and Wise, *The Dead Sea Scrolls Uncovered*, 125; and Wise, Abegg, and Cook, *A New Translation*, 314.

⁵² *The New Brown-Driver-Briggs-Gesenius Hebrew-English Lexicon*, 986b-987a.

Calendrical Documents makes the seemingly obvious interpretation questionable. Taking it as referring to a day of a particular month (Shebat) makes it the odd one out amongst the hundreds of references where the day of the month is recorded in these documents. Whenever the month is referred to it is always called by numerical order but never by name. Thus when one reads the word in this line as the Babylonian month name, one is claiming that a peculiar irregularity is found here. Of course if 4Q322 was a work consisting of only calendrical entries then the calendrical interpretation of the line would be more compelling. However, the work is a copy of the so-called “Annalistic Calendar”,⁵³ which does not only enumerate calendrical data but also incorporates large sections of non-calendrical descriptions of historical events. Therefore words in this manuscript are not necessarily calendrically related. In fact, lines found in the fragments of 4Q322 mostly belong to the non-calendrical descriptions instead of calendrical entries. Therefore the chance of line 2:2 being calendrically related is less likely than not, and the word שֶׁבַט is more likely to mean simply a tribe or a sceptre rather than the month Shebat or a priestly course.

The case of 4Q323 is even more obscure. What is left of line 4:5 is only a damaged and isolated word “[שֶׁן] לִמְ”. To reconstruct it as the Babylonian month name “Marheshvan” is possible but not definite. As a matter of fact, the fragment containing this word is so damaged that most of the translations have given up the attempt to speculate on any of its words and simply ignore it entirely. The reading of Milik is likely a speculation based on the manuscript’s calendrical context. However, similarly as in the case of 4Q322 the context of this manuscript is not enough to confirm every word of its fragments as being calendrically related. Also reconstructing the word as the name of a Babylonian month is not attested by any of the Qumran Calendrical Documents. Without the support from either the other documents or the context of this manuscript the proposed reconstruction is a mere possibility with no solid grounding. Such an uncertain reading should not be taken seriously as evidence for any theory of the Qumran calendar to develop from.

⁵³ The name is given by Wise to the text of six manuscripts 4Q322-4Q324c.

The claim that Babylonian month names are found in the Calendrical Documents is therefore unreliable. Hence the view of a co-ordination between the Qumran calendar and the Babylonian/Jewish lunisolar calendar existing in these documents is also questionable. As a result the lunar correlation of these manuscripts is rejected, and their information will not be taken into account in the subsequent analysis when evidence of the confirmed lunar related texts is extracted to formulate an overall picture of the Qumran Calendrical Document's lunar reckoning.

LUNAR CYCLE IN THE QUMRAN CALENDRICAL DOCUMENTS

The aim of this section is to build up a portrayal of the Qumran lunar reckoning based on material extracted from the confirmed lunar related sections of the Calendrical Documents. Thus the source material for the following synthesis is confined to:

- all the fragments of 4Q317
- the *Otot*-section (1 iv-vi) of 4Q319
- the section in fragment 1 (1 i-iii) of 4Q320
- the first section (1 i-2 i) of 4Q321
- all fragments of 4Q321a

Period of the Lunar Cycle

In the examination of the lunar correlation of the Calendrical Documents a cycle with the period of either twenty-nine or thirty days is found to be present in the documents. Such a cycle in the calendrical context is deemed to be connected with the lunar cycle. The periodic phase change of the moon is known in modern astronomy as the synodic month, which is equated to 29.530588 days. In the ancient past, calendars were usually determined by observations of the natural phenomena. Lunar months fixed in such a way almost inevitably turned out to have either twenty-nine or thirty days. However, the real-life observation way of determining the months produced no fixed or regular pattern for the cycle to vary between the two possible numbers of days. In

the process of development most lunar calendars gradually moved away from natural observation to astronomical calculation, with which a more regular pattern emerged. The evolved patterns more or less followed an alternating form but not always. There were always some disruptions to the alternating pattern now and then either for the adjustment with the natural cycle or out of other considerations.⁵⁴ In view of the presence of irregularities in most of the other lunar calendars it is necessary to check whether the lunar reckoning in the Calendrical Documents follows a regular alternative pattern or not.

The most extensive information for the lunar period comes from 4Q320 fragment 1 in which the duration between two successive occurrences of a lunar event is stated by the second element in each entry. The surviving data of this section are tabulated thus:

Entry in	Element 1	Element 2	Element 3
1 i 1-5	4 Gamul		
1 i 6		29	30/1
1 i 7		30	30/2
1 i 8		29	29/3
1 i 9		30	29/4
1 i 10		29	27/5
1 i 11		30	27/6
1 i 12		29	25/7
1 i 13		30 *	25/8
1 i 14		29 *	24/9
1 ii 1	5 Immer	30	23/10
1 ii 2	6 Jehezkel	29	22/11
1 ii 3	1 Jehoiarib	30	22/12
1 ii 5	2 Malchijah	29	20/1
1 ii 6	4 Jeshua	30	20/2
1 ii 7	5 Huppah	29	19/3
1 ii 8	sab. Happizzesz	30	18/4
1 ii 9	1 Gamul	29 *	
1 ii 10	3 Jedaiah	30 *	
1 ii 11	4 Mijamin	29 *	
1 ii 12	6 Shecaniah	30 *	
1 ii 13	sab. Bilgah	29 *	
1 ii 14		(30)	
1 iii 1		(29)	
1 iii 2		(30)	
1 iii 3		(29)	
1 iii 4		(30)	

⁵⁴ For examples see the modern lunar calendars used by the Jews or the Muslims.

1 iii 5		(29)	
1 iii 6		(30)	
1 iii 7		(29)	
1 iii 8		(30)	
1 iii 9		(29)	
1 iii 10	3 Huppah	30	5/8
1 iii 11	4 Hezir	29	4/9
1 iii 12	6 Jachin	30	3/10
1 iii 13	sab. Jedaiah	29	2/11
1 iii 14	2 Mijamin	30	2/12

* - reconstructed data confirmed by the extant data (in bold) in either one of the other two elements

() - data reconstructed according to the alternating pattern

All the extant figures of the second element (1 i 6-12, 1 ii 1-8, 1 iii 10-14) are always in an alternating pattern. In addition, since the three elements of the entries are interlinked with each other, any missing element of an entry can be firmly deduced from the other extant elements of the same entry. Some missing figures of the second element can be recovered in this way (shown in the table with an *). These reconstructed numbers also follow the alternating pattern. With each entry corresponding to a month in the 364-day year, there should be thirty-six entries for the entire three-year period of the section. Out of the thirty-six entries, the second element of twenty-six of them can be confirmed either by its own extant reading or by deduction from the other extant elements.

All together this leaves only ten unconfirmed missing entries (1 ii 14-1 iii 9). If the ten missing data are reconstructed according to the alternating pattern (as shown in the table), they fit perfectly well with the confirmed data. The complete reconstruction of the series of this element allow us to conclude that the lunar cycle in the Calendrical Documents is reckoned by a regular alternating pattern within a three-year period.

All the texts recovered for this section are within a period of three years. Whether the original writing covers only three years is not able to be proven by its surviving fragments,⁵⁵ but that the lunar cycle is co-ordinated with the 364-day year in

⁵⁵ The employment of the priestly roster as part of the calendrical calculation requires the enumerated cycle to be completed within six years, which strongly suggests that half of the original

three years is evidenced by the *duqah*-text of 4Q321 and 4Q321a.⁵⁶ With the confirmation of the alternating pattern within the three-year period, there remains one more question to be answered in investigating the lunar period of the Calendrical Documents: does the regular pattern consistently follow through, even at the point where the three-year periods meet? The enumerated event in 4Q320 fragment 1 has its first appearance on 1/1 of the first year, then it reoccurs with the alternating pattern starting first with a twenty-nine-day cycle. After thirty-six alternating cycles it falls on 2/12 of the third year at the end of a thirty-day cycle.⁵⁷ However, in order for the lunar cycle to match with the 364-day year in every three-year period the next recurrence of the event has to fall on 1/1 once again for the first year of the next triennial period. From 2/12 to 1/1 there are thirty days. So that is another thirty-day period following the last one. In this way the alternating pattern does not always apply because when the triennial periods meet it is interrupted by a double thirty-day period. Therefore the co-ordination between the lunar cycle and the 364-day year should be represented by $3 \times 364 \text{ days} = 18 \times 29 \text{ days} + 18 \times 30 \text{ days} + 30 \text{ days}$. The overall average for this reckoning is 29.513513 days ($3 \times 364 \text{ days}/37 \text{ cycles}$) instead of 29.5 days of a strict alternating pattern.

Locating the Critical Phases of the Lunar Cycle

How the schematic lunar cycle matches the changing phases of the moon has generated one of the largest debates in the study of the Calendrical Documents. There

text containing another three years is lost. However, three factors stand against such a speculation. Firstly, not a single entry is found for the presumed lost years. Secondly, extensive entries are extant for the recovered three years period, which cover from the first entry (first month of the first year) to the last entry (twelfth month of the third year) of the period. Thirdly, the three years period forms a self-contained cycle of its own.

⁵⁶ That the *duqah*-text contains two identical triennial lunar cycles within its sexennial priestly cycle is proved by the parallels between some entries despite the different priestly names, cf. 4Q321 1 iii 5 with 2 i 4; and 1 iii 7 with 2 i 7.

⁵⁷ This is attested in 4Q320 1 iii 14.

is no doubt that these documents fix the lunar cycle with either twenty-nine or thirty days, but the question is: at which stage of the moon does this cycle begin? This issue was first drawn to scholars' attention by Milik in his book *Ten Years of Discovery in the Wilderness of Judaea*.

Further study of the *Mismarot* from Cave IV, not yet finished, seems to favour the assumption that the Essenes computed the beginning of *their* lunar month from the full moon, not the new moon. Nevertheless, in one of their synchronistic tables, in addition to the correspondence between the day of their solar calendar and the first day of their lunar month they also note the day of the solar month on which the *new* moon falls; this correspondence is called *dauqah* or *duqyah*, which in Rabbinic literature means 'precision (obtained by an observation)' the root *dwq* meaning 'to examine, observe'.⁵⁸

Milik's statement produced an intriguing but clear idea of how the Essenes reckoned the lunar cycle. In this brief note Milik did not only provide an interpretation for the correspondence between the solar and the lunar calendars but also included an etymological explanation for the otherwise unknown word found in these texts. However, since its publication the content of this note has drawn various responses. Many disagree with Milik on both his interpretation of the cycle and his etymological explanation. Even though it is now more than forty years since this publication the diversity of scholarly views is still strong. In one of the recent translations of the Dead Sea Scrolls a consensus could not be reached by its co-authors on this subject and had to be settled by a compromise translation. Alongside it a remark is stated to express their differences: "scholars are still debating the options for *duq*, and a reasonable case can be made for either approach. The authors of this book do not themselves agree on what it means but have decided to translate according to the full-moon option."⁵⁹ This demonstrates, on the one hand, the difficulty and uncertainty of reading these texts, and on the other, their significance for the understanding of the Qumran calendar.

⁵⁸ Milik, *Ten Years*, 152, note 5.

⁵⁹ Wise, Abegg, and Cook, *A New Translation*, 300.

Etymology of *duqah*

The text represented by the manuscripts 4Q321 and 4Q321a has two sections, and the first section is characterised by an unusual word *duqah* (דוקה). This *duqah*-text records the recurrences of two lunar events in a six-year period. Since no appellation is given in the text for one of the events, the name *duqah* given for the other event seems to form the only and indispensable clue for resolving the problem of the lunar stages they represent. Unfortunately, this crucial word is a *hapax legomenon*.

Therefore no support can be drawn from other Hebrew writings in order to discover its exact meaning. Although the word occurs many times throughout the whole *duqah*-text, it is always in the same form and with the same usage. Thus the context of its present text does not help much either. In the absence of other means to locate the meaning of an otherwise unknown word, etymological analysis remains a feasible way to help to reach its possible meanings. Although the meaning of a word is not necessarily connected directly to its etymology, the connotations of the root can at least provide a guideline to narrow down the conjectural possibilities.

Nevertheless the etymological approach to narrow down the meaning of דוקה has proved itself to be no easy task for scholarly opinions differ even on the etymology of the word. Two possible roots have been suggested for the word to be developed from, דוק⁶⁰ and דקק⁶¹. Detailed research of the usage of the two proposed root words in the Semitic languages was conducted by Wise which provides a thorough coverage of their possible basic and extended meanings.⁶² According to Wise's study, דקק is a more common word and is attested in various branches of the Semitic languages. Despite its widespread application all the uses of the word in different languages resonate with a similar basic idea. It is either used to mean the act of breaking things into pieces (i.e. to crush, to pulverise, to shatter, or to ground) or

⁶⁰ Suggested by Milik in *Ten Years*, 152, note 5.

⁶¹ Suggested by Talmon and Knohl in "Mšmarot B^a, 4Q321", 298.

⁶² Wise, *Thunder in Gemini*, 245-228.

to mean the result of such an act (i.e. to be small, fine, thin, or withered). Compared to דקק, the other proposed root דוק is not so common and is mainly attested in the Aramaic family. The basic meaning of the word is “to look at something carefully”, and from this it may be extended to mean “precision” (as an abstract substantive) or “exactly” (as an adverb). Wise has highlighted this root’s usage in Syriac as being particularly noteworthy in attempting to derive the meaning of דוקה. In Syriac the root דוק is still confined to the basic meaning of “to look”, but it is in particular connected with making astronomical observations.

So how do scholars propose to understand דוקה and how do they relate their understandings to the possible etymological roots of the term? To illustrate the difficulty and inconclusiveness of this approach, the three most comprehensive proposals are listed for comparison:

Milik⁶³

root	- דוק
דוקה	- the day on which the new moon falls
meaning	- to examine, to observe (the new moon)

Wise⁶⁴

root	- דוק
דוקה	- the day when the moon is full
meaning	- observation (of the full moon)

Talmon and Knohl⁶⁵

root	- דקק
דוקה	- the day when the full moon begins to wane
meaning	- to become thin

Milik’s contribution to the discussion, although brief, is most influential. His suggestion has gained wide acceptance. According to Wise’s analysis, the root דוק is not as common as דקק, but is still widely attested in Aramaic with the basic meaning of “to look at something carefully”. The special usage of the word in Syriac in

⁶³ Milik, *Ten Years*, 152, note 5.

⁶⁴ Wise, *Thunder in Gemini*, 228.

⁶⁵ Talmon and Knohl, “Mišmarot B^a, 4Q321”, 298.

association with astronomical observation could persuade one to connect this meaning with the context of the *duqah*-text. The problem with this proposal is that there is no way to determine from the root meaning just what is being observed. The term may refer to the object of an observation or the action of observing, but in either case it does not define the phase of the moon being observed.

Milik's interpretation that *duqah* is the observation of the new moon is a legitimate one. For thousands of years the Babylonians relied on the appearance of the new moon to fix their months. The same method was being used by the Jews even up to the early centuries CE before it was gradually replaced by the method of calculation. Therefore understanding *duqah* as meaning the sighting of the new moon would be plausible as this was a common practice of the time and place when and where the text was produced. However, this association with a common practice can only make the proposal more plausible but cannot rule out other possible explanations.

Wise's proposal follows the same line. After his study on the two possible etymologies Wise opts for the root דוק and takes the basic meaning of *duqah* to be associated with something of an astronomical observation. However, what he suggests as the object of observation is the full moon instead of the new moon. The reason that leads him to draw such a conclusion is not from the *duqah*-text itself but from other Qumran works which are related to the cycle of the moon.⁶⁶ Although it is not easy to determine the full moon as it is the new moon by observation, it is still a lunar stage that can be fixed simply by looking at the phase change of the moon each night. In fact, one could even say that the full moon is the most spectacular one among all the different phases. Therefore Wise's suggestion cannot be rejected.

From these two proposals we can see that even if the meaning of *duqah* can be confirmed as "astronomical observation", there is still the difficulty of pinpointing the lunar phase being observed. Actually following this line of argument one can make a connection between the term and almost any lunar phase, with the possible exception

⁶⁶ Wise, *Thunder in Gemini*, 228. The works cited by Wise to support his theory are 4QEnastr, 4Q503, and 4317, which, Wise thinks, all have the full moon located in the middle of their months, as is the *duqah* in the *duqah*-text.

of the dark moon. When the moon is in the conjunction of its path it is totally dark and invisible and thus is not something which can be observed by our eyesight. To say something like “observing the invisible moon” may appear unsound. However, the basic meaning of קוץ can be extended to mean “to examine precisely, to determine exactly”, and in that case the term *duqah* could still arguably mean the “precise” result of an examination (of the time when the moon is in its conjunction).

The other root קקץ suggested by Talmon and Knohl has also gained wide acceptance, but it also can be applied to different stages of the lunar cycle. Throughout the wide range of Semitic languages the word is connected with the basic meaning of “to break into pieces” or “to be thin”. Talmon and Knohl make the connection between the root and the term *duqah* by focusing on the action of the root word - to make thin, to become small, and apply it to the time when the moon is just about to come down from its fullness - that is, the thinning of the moon. This focus and application of the root meaning of the term are fair enough, but again it does not limit the term to only that particular moment. Throughout the whole waning process, from the first night when the moonlight starts to reduce to the night when it is no longer to be seen, the moon is in the process of “to be thin”. Taking the term to mean “thinning” may exclude the phases in the waxing process, but there still remains half of the lunar cycle as possible time for the term to represent.

Furthermore, applying the root קקץ to the term *duqah* is not limited to Talmon and Knohl’s interpretation. This root word, as well as meaning the action of breaking, can also represent the result of such action, that is as an adjective to mean “thin, small, fine”. This adjectival usage fits well with certain stages of the lunar cycle. The sighting of the last moon in the west just before dawn and the first appearance of the new moon in the east just after sunset are the times when the moon has just enough light to still be seen. To describe the barely visible moon in these stages as “small” or “thin” could not be more apt. The choices of lunar phase for this application of the root meaning to the term may be limited but it still remains a possible interpretation.

The survey on the proposed roots and their associated interpretations for the term *duqah* shows the range of possibilities and inclusiveness of the etymological approach. Firstly, one has to decide between two equally viable roots. Secondly, even

if one opts for either one in particular, the meaning of the chosen root can still be applied to a number of different phases of the moon cycle. Thus to resolve the problem of how the Qumran lunar cycle matches with the phases of the moon, as well as to find out the meaning of the term *duqah*, we need to resort to another approach.

Lunar Phase for the Beginning of the Qumran Lunar Cycle

A more definite answer in identifying the lunar phase for the beginning of the Qumran lunar cycle can be reached in 4Q320 fragment 1. Some scholars have already resorted to using the first five lines of this section (1 i 1-5) to argue for the full moon option.⁶⁷ However, in order for these lines to make a proper contribution to the question discussed, two fundamental points about this section have to be resolved first: (1) What is the purpose of the section 4Q320 1 i-iii? (2) What is the function of the first five lines in this section?

Purpose of the Section 4Q320 1 i-iii

In his early work Milik quoted an entry from this section as an example, “Friday in Yehezq’el, the 29th (day) - the 22nd of the eleventh month” and interpreted it as “the 22nd of the eleventh month (of the first year in the religious calendar) falling on the Friday in the week when Yehezq’el is on duty, corresponds to the 29th (and last) day of the eleventh month (Sebt) in the luni-solar calendar.”⁶⁸ His understanding of the text as a synchronism of the 364-day calendar, the Jewish lunisolar calendar, and the weekly roster of the priests has dominated the understanding of this text ever since, and the term “synchronistic calendar” is frequently used to describe it. As more

⁶⁷ VanderKam, “Calendrical Texts”, 381; Albani, “Die lunaren Zyklen”, 24-25; C. Martone, “Some Observations on the New Mishmarot Texts from Qumran,” in D. W. Parry and E. Ulrich (ed.), *The Provo International Conference on the Dead Sea Scrolls: Technological Innovations, New Texts, and Reformulated Issues* (Studies on the Texts of the Desert of Judah 30; Leiden: Brill, 1999) 443-449, 446-447.

⁶⁸ Milik, *Ten Years*, 108. The same example is quoted in “Le travail”, 25.

material of the Calendrical Documents has been published, modifications on the nature of the synchronised elements have been made but the concept of synchronism has not been challenged in general.

The example quoted by Milik consists of three elements, and in the original text they appear as:

Element 3	Element 2	Element 1
ב/ז בעשתִי עֶשֶׂר	ל'////////ז	ב'//// ביחזקאל

There is no problem with the interpretation of the first and third elements. The date of the entry is provided in the first element by the weekday of the priestly service according to the six-year priestly cycle and in the third element by the day and month according to the 364-day calendar. The problem comes with the interpretation of the second element. Milik, as do subsequent translators, saw this element as referring to the same day marked according to a lunar calendar. By interpolating the order of the month in the third element to the lunar date Milik concluded that a correspondence between the two calendars is reached here - “the 22nd of the eleventh month (of the first year in the religious calendar) ... corresponds to the 29th (and last) day of the eleventh month (Sebt) in the luni-solar calendar”.

One must ask why the text would enumerate the correspondence by marking the end of the lunar months but not their beginning. If this is a synchronism between the lunar and the solar years it will be more logical that the text states when the first days of the lunar months fall in the 364-day year rather than the last days. Milik did not elaborate on why he saw the text synchronising the two calendars in this way. Whilst most of the translations or studies silently pass over this peculiarity, some scholars do try to provide explanations.⁶⁹ However, instead of providing rationale to support the peculiar reading, the suggested explanations are actually grounded on the reading itself and the scholars’ own particular interpretation of the text. Without a

⁶⁹ For examples see Wise, *Thunder in Gemini*, 43, particularly note 96; and Talmon and Knohl, “Mšmarot B^a, 4Q321”, 298-9.

proper explanation this anomaly of marking the last day of the lunar months remains an obstacle in reading the text as a synchronism of two calendars.

In addition to the lack of an explanation for the anomaly of marking the last days of the lunar month, a more serious problem for understanding the text as the synchronism of two calendars emerges when its data are analysed. The problem appears at the very beginning of the text. Being considered as a synchronistic calendar the table of correspondence between the two calendars is usually taken as starting with the entry in line 6 of the first column, which runs as: “The 5th of (the week of) Jedaiah (corresponds) to the 29th (day of a lunar month, and falls) on the 30th of the 1st (month according to the solar calendar)”.⁷⁰ Reading down from this entry this interpretation seems to be appropriate for the text. However, the problem is not with reading down the text from this apparent beginning of the table in line 6 but rather with the unrecorded data when the recorded dates are extrapolated back to the period prior to them.

Line	Weekday	Lunar date	Solar date
?	day 4 of Gamul	?	1st of 1st month
1 i 6	day 5 of Jedaiah	29th of 1st month	30th of 1st month
1 i 7	sabbath of Hakkoz	30th of 2nd month	30th of 2nd month
1 i 8	day 1 of Eliashib	29th of 3rd month	29th of 3rd month

If 29/1 of the lunar year is equivalent to 30/1 of the solar year, then the lunar 1/1 has to fall on the solar 2/1. Two questions have to be asked about this assumption. Firstly, would the author of the text really reckon two different calendars which are misaligned by one day, and if so, then why and how does this misalignment come about? Secondly, what would be the equivalent in the lunar calendar for the solar 1/1?

In the Calendrical Documents “the 4th day of the week of the sons of Gamul” is repeatedly emphasised as the beginning of all the years and other time units,⁷¹ and this emphasis reflects how the documents compute the beginning of time reckoning with the fourth day of the creation week, the day when the sun and the moon were

⁷⁰ Translation from the *Study Edition*.
⁷¹ The phrase can be found in 4Q320 2 i 2-5; 4 ii 10-14; 4Q319 10:4-8.

created. If this day is regarded as the beginning of time because God created the time regulators on this day, then both the solar and the lunar calendars should have the same starting day. Interpreting 4Q320 1 i 6 as a correspondence between the 29th of the first lunar month and the 30th of the first solar month is to suggest that the lunar calendar started a day behind the solar calendar.

No scholar other than Wise has tried to resolve this “one day” discrepancy. Wise’s approach is to suggest that the two calendars have different starting points not only for their years but also for their days.⁷² The lunar day begins with the evening when the moon appears, while the solar day starts at dawn when the sun rises. The two heavenly bodies were created on the same day, but the solar day began first and only when half of this day was gone did the lunar day start with the coming of the evening. Wise argues that in constructing the correspondence table the two different starting times of the days were aligned together by shifting the lunar day half day forward, which means that the first half of the first lunar day was disregarded and it was counted as starting with the dawn on the second solar day. In so doing the lunar year fell one day behind the solar year at the beginning of time reckoning. Wise’s suggestion may be a possible explanation for how the one day difference came about. However, to accept Wise’s view one has to assume that:

- (1) there are two calendars in this text, one based on the moon and the other based on the sun;
- (2) because their prime regulators are different the two calendars have different starting points for the beginning of their days;
- (3) there is an adjustment to bring in the alignment between the two different ways of reckoning the day;
- (4) to align the two ways of reckoning the lunar calendar has to give up its regulating principle to match with the other;
- (5) the alignment is carried out by shifting the time forward disregarding part of the existing lunar day instead of pushing the reckoning backward to

⁷² Wise, *Thunder in Gemini*, 42-43.

include the half day that did not count in the lunar day but already existed in the solar one.

Each one of these points is an assumption that demands vigorous proof, and so far none is forthcoming. Does this interpretation really represent what is found in the text or does it reflect what one might want to find in it? Wise's suggestion is a genuine attempt to provide a logical explanation for a difficult problem with this widely popular interpretation of the text. However, the difficulties mentioned in accepting it signal that perhaps it is time to give up this prevailing but problematic interpretation and to look for a better alternative.

Regarding the question on the lunar equivalent for the solar calendar day one there can be two possible answers: (1) there is no equivalent in the lunar calendar for this day, or (2) this day corresponds to the last day of the preceding month in the lunar calendar. However, both answers are problematic.

With the "no equivalent" answer it suggests that there is a gap for the lunar years at the beginning of the three-year period enumerated by this text. However, as we know that the text is meant to be representing a cycle which is repeating every three years, a gap in the lunar calculation would inevitably disrupt the three-year period being run as a repetitive unit. Thus the repeating property of the cycle prevents the view that there is a day in the solar calendar which has no correspondence in the lunar cycle.

If one understands the first solar day as equivalent to the last day of a lunar month, one will find the record of entries is opposing this possibility. According to the synchronistic-calendar interpretation, the text is supposed to have recorded every single last day of the lunar months in the three-year period. If day one of the solar calendar is equivalent to the last day of a lunar month this should be recorded among the entries. More correctly it should appear in front of line 1 i 6 as the first entry, which in terms of the synchronistic interpretation should read something like "The 4th of (the week of) Gamul (corresponds) to the 30th (day of a lunar month, and falls) on the 1st of the 1st (month according to the solar calendar)". The absence of such an entry means that either the text does not agree with such a correspondence or there is problem with the interpretation.

Despite its widespread acceptance, understanding the three columns of 4Q320 fragment 1 as a synchronism between a lunar and a solar calendar cannot be supported. Such an interpretation produces many questions that have not or can not be answered. Instead of struggling on with these inherent problems, as some scholars have done, a better approach is to simply give up this long-established interpretation and to take a fresh look at the text from a different perspective.

That the section in 4Q320 fragment 1 is closely related to the lunar cycle is certain. However, the lunar connection does not necessarily imply that there is a lunar calendar in the text. In the sense of a system for arranging days, weeks, and months to indicate point, length, or division of time, there is only one calendar in this text and that is the 364-day calendar. The lunar cycle is not used in this text for indicating events in time but itself is the object of enumeration. In the Calendrical Documents particular events, such as festivals and special calendrical days, are enumerated entry by entry. This text is no different from the others, only this time the recorded event is related to the lunar cycle. What is marked in this text is every single day when a particular phase of the moon occurs in the three-year period. Each entry represents one of these occurrences and the duration between two consecutive entries is equal to the period of one lunar cycle.

The key problem for interpreting this text is in the middle element of the entries. This element consists simply of a preposition 𐤀 and a number in numeric symbols. In general whenever a number is found in the Calendrical Documents, no matter it appears in ciphers, in cardinal form, or in ordinal form, it is usually representing the order of day, month, year, or jubilee. However, this common practice does not preclude this number being read otherwise. An illustrative example of finding a ciphered number not representing the order of a calendrical unit comes in the same manuscript. In the section starting with 2 ii 5, each of its entries also contains three elements and the second element happens to be also a ciphered number but only this time it is not accompanied by any preposition. The general understanding of this section is that it is a month by month list for the whole sexennial priestly cycle listing in each entry: (1) the order of the month, (2) the number of days in that month, and (3) the priestly family serving at the beginning of that month. Although the section is

badly damaged with no single entry fully preserved, it is indisputable that the cipher number in the middle of the entries stands for the number of days in each month of the 364-day year. Drawing the interpretation from this analogous case, we can see that the ciphered number in the middle of the entries of the lunar related section in fragment 1 does not refer to the order of a day but to the number of days in a period. The preposition ל in general means “to, for, in regard to”. Therefore if the number is taken as referring to the order of a day, translating the ל as “corresponding to” or “equals to” is a reasonable reading. However, the versatility of the preposition allows it to be translated differently. *The New Brown-Driver-Briggs-Gesenius Hebrew-English Lexicon* lists the usage of the preposition with regard to time mainly as meaning “to, towards, against”, but it also points out a relatively rare usage: “to denote the close of a period” as in Gen 7:4 or Amos 4:4.⁷³ Therefore it can also mean “at the end” of a certain time, or simply “after” a certain period of time. The whole middle element instead of referring to a date in the lunar calendar is more likely to be read as “after 29 days” or “after 30 days”. Therefore, the whole section of 4Q320 fragment 1 functions as a record of the recurrences of a particular lunar event by stating the dates of the recurrences as well as the durations separating them.

Function of the Introductory Lines (1 i 1-5) in 4Q320 fragment 1

Taking the same line quoted by Milik as an example, the proposed new reading would have it read like: on the 6 of Jehezekel after 29 (days) on the 22 of the eleventh (month). However, the translation of this single line standing on its own does not make much sense for it only provides a date and a duration of time but does not tell what the enumerated event is. In this respect all the entries have to be read as a whole. The lines written with the standard formula are all abbreviated forms of the more fully described entry right at the beginning of the text, and they can only be understood properly when read together with this first entry. The entry in line 1 i 6, as mentioned before, is usually taken as the beginning of this recording list. In fact it is not the first

⁷³ *The New Brown-Driver-Briggs-Gesenius Hebrew-English Lexicon*, 516, 6b.

but rather the second following immediately after the introductory entry which is recorded in a much more elaborated manner in lines 1-5. The date given in line 6 is 30/1, and the duration separating this entry and the previous one is twenty-nine days. Counting back twenty-nine days from 30/1 the first event falls exactly on 1/1, the very first day of the whole enumeration. The date 1/1 is not found in the lines 1-5 but its equivalent in the priestly roster is. “On the 4th of the week of the sons of Gamul, in the first month of the first year” (lines 3-5) this can only refer to the first day of the month. Thus these five lines are part of the enumerating list. More important still, they do not only simply state the date for the first occurrence of the event but also provide a detailed description of what this event is - the appearance of the moon on this very day. In the subsequent entries this description of the lunar stage is assumed but not explicitly stated. Since the subject matter has already been clearly stated in the fuller first entry, only the date and the separating duration are considered sufficient to mark the recurrence of the event with the other entries. Therefore, the first five lines of the section are not a general introduction but function as the most important entry of the list providing substantial information for the reading of the succeeding entries.

Lunar Phase Disclosed in the Introductory Lines of 4Q320 1 i-iii

Establishing a proper understanding of the purpose and structure of the section 4Q320 1 i-iii paves the way for the key purpose of discussing this lunar related text: to see how the lunar cycle matches with the phases of the moon. This text is confirmed as charting the recurrences of a particular phase of the moon, and the stage of the charted lunar phase is disclosed in the introductory entry in lines 1-5. These lines are repeated here for easy reference:

1. Jto show it from the east.
2. [And] to cause it to shine [in] the middle of the sky, on the foundation of
3. [the firmamen]t, from evening till morning on the 4 of the week of
4. [sons of G]amul, *vacat* for the first month in the
5. [firs]t year;

There is no explicit wording in the passage expressing the moon phase, but there are hints that allow us to narrow down the possibilities.

L. 1-2 “to show” (להראותה) and “to shine” (לאירה)

The first clue is to be found in the two verbs in the passage. They are both suffixed infinitives. Whilst the ambiguity of their subject and suffix referent allows for a wide range of speculation, the verbs themselves provide useful information on the lunar phase being described. The stage of the moon on this day must be something that can be seen (ראה) and can give out light (אור). Of course these qualities, to be seen and to give out light, can be associated with most stages of the lunar cycle, but not with all of them. There are a couple of nights during the lunar cycle when the moon is in total darkness and cannot be seen, that is when the moon is in conjunction. Furthermore, the nights near the time of conjunction are not likely to be described by these verbs either. The disappearing old moon and the looming new moon can be seen at night but only briefly, and it is certainly not apt to say that they shine in the middle of the sky at night. No doubt the best candidate to fit in with these verbs is the full moon, when the whole moon is able to be seen and its light is at its brightest. Therefore these words, on the one hand, exclude the lunar conjunction and its surrounding nights, and on the other hand, strongly hint at the full moon being described.

L. 1 “from the east” (מן המזרח)

Taken as an ordinary comment it is in general true to say that “the moon shows from the east”. However, if the description is referring to a particular phase of the moon, then not every single night can fit in with the phrase. Not every night can the moon be seen rising in the east. It is only during the nights from the full moon to the disappearing old moon, that is during the process of waning, that the moon comes forth in the east at night, although the time of its rising is gradually delayed from dusk (full moon) to dawn (old moon). For the other half of the cycle, that is during the waxing process, when evening comes the moon has already travelled part of the sky

and appears in the middle of it. Thus the phrase hints at the nights of the moon's waning but not its waxing time.

L. 3 "from evening to morning" (מערב עד בוקר)

The phrase covers the whole night time. Similarly, it is in general true to say that the moon shines at night. However, to say that the moon shines throughout the whole night time can only refer to one particular phase, that is the full moon. Only on this night is the moon to be seen rising in the east right after sunset, moving across the sky throughout the whole night, and setting in the west at dawn. During the other nights the moon is not able to be seen for some part of the night, either near sunset or sunrise.

The three clues delimit the stages of the moon described in the passage. The degree of limitation set by each of them varies, but there is one lunar stage which can fit in with all these limits, that is the moon at its fullness. The wording in the first entry although not explicit is specific enough to demonstrate that it is the full moon it describes. Therefore we can reach a firm conclusion that the lunar reckoning in the Qumran Calendrical Documents does start with the full moon.

Meaning of duqah

After concluding that the Qumran lunar reckoning begins with the full moon, we may return to the problem of the meaning of the term *duqah* and see what further knowledge on the lunar calculation we can obtain from the *duqah*-text. The *duqah*-text contains month by month entries in two parts. Whilst the second part of the entries is headed by the term *duqah*, the first part bears no heading but just a date. This free-standing date without an appellation is usually regarded as the "unnamed event" and designated by the symbol "X". Did the author deliberately conceal the name of this event or did he consider it unnecessary to repeat what he had already stated before at the beginning of the text? If this text is compared with the lunar

section in 4Q320 the latter is more likely to be the case. The close connection between the two texts is obvious. Not only does the same list of dates appear in both texts, but the style and format for part of their entries are also almost identical. The resemblance of the two texts enables the writing style of the *duqah*-text to be better understood by the help of the other text. In the lunar section of 4Q320 all the standard entries, that is all the entries other than the fuller first one, appear to bear a date and a period but without appellation, which is very similar to the situation of the “unnamed” part of the *duqah*-text. So, the *duqah*-text is also likely, to be the same as 4Q320, to have a more elaborated description of the condition or appearance of the full moon in the very first entry of the list. This fuller entry is preserved in 4Q320 but not in the *duqah*-text. Thus in the *duqah*-text it does not purposely avoid calling this event by name but has named it at the beginning.

The identical lists of dates in the *duqah*-text and the lunar section of 4Q320 are records of the same event. Therefore the conclusion of the discussion of the 4Q320 lunar section may also be drawn for the first part of the entries in the *duqah*-text; they are recording the days when the full moon appears. If the first part of the entries is representing the days of the full moon, then the second *duqah* part could only stand for the days of the new moon. As most of the other studies on this text have already pointed out that the *duqah* almost always precedes the event X by thirteen days.⁷⁴ A fourteen-step function is used in the Calendrical Documents (4Q317) as well as in the *Astronomical Book* to calculate the daily amount of moonlight. By this method the total amount of moonlight at the full moon is taken as fourteen parts, and each night the moon is considered to increase or decrease one part of its light during its waxing and waning processes. According to this fourteen-step calculation, counting back thirteen days from a full moon would arrive at the day when the moon had only one part of light. In other words *duqah* is the day when the new crescent is just able to be seen. Being associated with this lunar phase the word could mean the “little” (קק) moon, or the “sighting” (ק) of the new crescent.

⁷⁴ See Talmon and Knohl, “Mišmarot B^a, 4Q321”, 292-293.

Locating the lunar phases for the two recording events of the *duqah*-text allows the text to supply further information for the understanding of the Qumran lunar reckoning. Although the two events are, in general, separated by fixed intervals, an anomaly in this fixed pattern discloses further information on how the author treated the lunar cycle. Throughout all the first thirty-six cycles in the three-year period the general pattern holds,⁷⁵ but it is broken in the last 37th cycle. For thirty-six cycles if the full moon is taken as the first day of the cycles then the *duqah* always falls on the 17th day of a twenty-nine-day cycle and on the 18th day of a thirty-day cycle, but in the 37th cycle, which has thirty days, its *duqah* falls on the 17th. Starting with the full moon on 1/1 of the first year the 37th appearance of the full moon falls on 2/12 of the third year.⁷⁶ After that the next full moon comes on 1/1 of the first year of the next triennial period. There are thirty days between these two full moon days. With a thirty-day cycle the *duqah* is expected to come seventeen days after the full moon of 2/12, that is on 19/12. In 4Q321 the last entry of the two identical three-year cycles are partially preserved providing indisputable evidence for the breaking of this general rule.

1 iii 7	the 12th month of the 3rd year:	and <i>du]qah</i> on the fourth of Abijah on the eighteenth of it.
2 i 7	the 12th month of the 6th year:	and <i>duqah</i> on the four[th of Jehezk]el on the eighteenth [of it.

In both entries the *duqah* is clearly stated as falling on the 18th of the month on the 4th day of the week. So the text has put the *duqah* of this cycle in sixteen days after the full moon following the twenty-nine-day cycle pattern instead of the expected thirty-day cycle pattern.

⁷⁵ Although not every *duqah* date of the thirty-six entries is attested in the extant fragments, all the surviving data of these dates agree with the general pattern. For the surviving data see the transcriptions of 4Q321 and 4Q321a in chapter 2.

⁷⁶ This can either be reached by taking the data from the entry in 4Q320 1 iii 14 or by calculation following the alternating 29/30 days pattern.

What this anomaly reveals is that the last lunar cycle in the three-year period is a twenty-nine-day one instead of a thirty-day one. Putting this back into the pattern of the lunar period discussed above it will be found that the alternating pattern is not broken by a double thirty-day cycle at the end of the three-year period but rather it continues all the way through the entire thirty-seven cycles. It is only after counting the cycles uninterruptedly with the alternating pattern for thirty-seven times that the lunar cycle is then intercalated with an extra day to bring it into alignment with the 364-day year.⁷⁷ Based on this finding a more appropriate representation of the relationship between the Qumran lunar reckoning and the 364-day year should be: $3 \times 364 \text{ days} = 18 \times 29 \text{ days} + 18 \times 30 \text{ days} + 29 \text{ days} + 1 \text{ day}$.⁷⁸

This revised representation reflects also the subordinate role of the lunar cycle in the Calendrical Documents. The lunar cycle is schematised by a regular alternating pattern and when the regular scheme comes close to the year cycle it is forced into agreement with the prime regulator of the calendar, the 364-day year, by an inserted day. Although the number of lunar related texts among the Calendrical Documents show that the lunar cycle is highly esteemed in these documents, it could never challenge the supreme position of the 364-day year as the calendar's fundamental controller. The authors of these lunar related texts were interested in when and how the lunar cycle runs, but they were more keen to find out how this cycle could be fitted into their favoured calendar.

⁷⁷ The idea of an extra day being inserted to bring the lunar cycle in alignment with the 364-day year is briefly expressed by Wacholder and Abegg in the *Preliminary Edition*, 68.

⁷⁸ The widely popular representation $3 \times 364 = 3 \times 354 + 30$ expressed in most of the studies on the Qumran lunar reckoning is a misinterpretation because (1) it has falsely assumed the presence of a lunar year of 354 days in the Qumran Calendrical Documents, (2) without the concept of a lunar year the last cycle cannot be seen as an intercalated month, (3) the last cycle is not reckoned with thirty days but with twenty-nine days plus one extra day. This misinterpretation is made under the influence of the synchronistic calendar interpretation and the calendrical material from *1 Enoch*.

Model for the Phase Change of the Lunar Cycle

The understanding of the Qumran lunar reckoning can be further enriched by looking at the detail of how the moon changes its shape over its cycle. For this we have to turn to the cryptic text 4QPhases of the Moon (4Q317). This text is a day to day record of the amount of light shown of the moon according to a certain calendar which is likely to be the 364-day calendar.⁷⁹ Had it survived the text would have formed a complete guide for the understanding of the Qumran lunar reckoning. Unfortunately, the manuscript recording this text is badly damaged, and its surviving fragments are full of corrections and inserted remarks which greatly hinder a definite reading of their contents. However, with the best preserved fragment 1 an almost complete lunar cycle is still recoverable which can provide some evidence about how the lunar cycle is perceived in this text.

A fourteen-step method is used in the text to calculate the amount of moonlight. The total amount of moonlight is divided into fourteen parts and it increases by one part (מחלוקת in 2:10 and 4:14) each day from darkness for fourteen days until the full moon and then it starts to decrease one part each day until it is back to darkness. The text preserved in 1 ii 2-33 covers a period from day 5 to day 25 of a certain month. On day 7 the moon is said to have covered fourteen parts of its light. In other words, it is completely dark on this day. On day 8 the moon is at the transition between waning and waxing, but at this point nothing is mentioned about the number of parts of light. Obviously after it reaches its darkness on day 7 and before it starts to reveal its first part of light on day 9, it can only remain totally invisible on day 8. Therefore, there are two days (day 7 and 8) that the moon remains in darkness.

The text then goes on listing how the moon reveals more and more of its light starting with day 9 until it reaches another transitional point on day 22, the moment of changing from waxing to waning. A problem with finding the transitional point on day 22 is that if the daily one-part increment is followed closely without interruption from day 9 to day 21 the amount of moonlight revealed on day 21 would have only thirteen

⁷⁹ For the identification of this calendar see discussion in pages 201-204.

parts. Comparing this with the entry before the previous transitional point (i.e. the one in lines 5-6) one may wonder where the day of fourteen parts of light has gone? This apparent discrepancy is noted by Wise, and he suggests that it is a scribal mistake.⁸⁰ With the numerous corrections and adjustments found in the manuscript Wise thinks that the scribe was confused by the tedious enumeration and kept on making mistakes all the way along in his writing. The omission of the fourteen-part day before day 22 is just another mistake made by the scribe. Wise hence argues that the correct day for the transitional entry in lines 27-31 should be day 23 because day 22 should be the day with fourteen parts of revealed light. However, is it necessarily the case for every half lunar cycle to have a fourteen-part day before the day of transition? A simple calculation will show that it is not. If the assumed pattern is applied to every half lunar cycle then there would be fifteen days in each of these half cycles (fourteen incremental days plus one transition day). This would result in every lunar cycle having thirty days, which is not only contradictory to what is found in the Qumran lunar reckoning but is also unacceptable to any lunar reckoning in general. In fact, it is exactly this omission of the fourteen-part day in the half cycle from day 9 to day 22 which reveals how the lunar cycle is reckoned in the text.

From day 9 to day 21 there are thirteen days, and during this period the amount of moonlight increases from one part to thirteen parts. On day 22 there is no mention of the amount of moonlight but the more elaborate description of this day discloses that the moon is at the utmost point of releasing its light and is about to diminish. This can only refer to the full moon. In other words the moon has kept on increasing its light by one part from day 21 to day 22 till it reaches its fullness. So this very day (day 22) is not only the day when the moon has all fourteen parts of light but also the day of transition from waxing to waning. Unlike the situation in day 7 and 8, the moon does not linger with the same phase for an extra day, but once its fullness is reached it immediately starts to cover up its light the next day. Therefore, there is only one full moon day (day 22) during this transition.

⁸⁰ Wise, "Second Thoughts", 117-8.

Discovering that the text has two days of darkness but only one day of full moon for this preserved cycle allows us to formulate a model for its lunar reckoning by considering how the fourteen-step function may be adjusted to represent the lunar cycle. That such a function is used in the text for counting the moonlight is certain, but it is not an entirely adequate method of representing the lunar cycle. Fourteen days of waxing plus fourteen days of waning can only add up to twenty-eight days; there are one (in a twenty-nine-day cycle) or two days (in a thirty-day cycle) which remain unaccounted for. A reasonable method of adaptation would be to assign these remaining days to the extreme phases; and a logical way to distribute these extra days would be to assign one of them constantly to a particular phase and to give to the opposite phase the other remaining day whenever it occurs. In order to keep the lunar cycle more or less symmetrical, a thirty-day cycle is most likely to be divided into two balanced halves (both with fourteen incremental days plus one more day on each of the extreme phases). However, for a cycle of twenty-nine days one of these extra days has to be omitted in order to keep the correct number of days. The preserved cycle in the text shows that it is the full moon which gives way in the enumeration. Based on this finding a general model can be formulated for the lunar cycle of this text. Taking the cycle as starting on the day when the full moon first appears, it would run as follows:

twenty-nine-day cycle

Full moon (14pts)	Waning (from 13pts to 1pt)	Dark moon (0pt)	Waxing (from 1pt to 13pts)
1 day	13 days	2 days	13 days

thirty-day cycle

Full moon (14pts)	Waning (from 13pts to 1pt)	Dark moon (0pt)	Waxing (from 1pt to 13pts)
2 day	13 days	2 days	13 days

Although the scarcity of available data and the ambiguity caused by the corrections hinder a thorough understanding of 4Q317, its preserved calendrical data still allow a model of the phase change of the lunar reckoning to be established.

Continuity of the Lunar Cycle

The next aspect of the Qumran lunar reckoning to be looked at is how the lunar cycle is understood to run over a long period of time. The previous discussions confirm that there is a repeating three-year cycle for the lunar reckoning in the Qumran texts. The question concerning this aspect is the consistence of this three-year pattern in representing the lunar cycle over a long period of time. The *duqah*-text shows that the three-year pattern is repeated without interruption for six years. Is this three-year period meant to be repeating continuously, or has it to be adjusted over a certain period of time, say after every six years? For these questions we have to turn to another text, the *Otot*-text in 4Q319.

Although its brief and highly regular entries allow the *Otot*-text to be reconstructed almost entirely with certainty, there remain a lot of unanswered questions about this text. While some of the questions, such as those concerned with the numbering of the jubilees, the number of signs in each jubilee, and the structure of the entries, will be dealt with when the text is studied in more detail in the next chapter on intercalation, at the moment only its lunar element will be looked at. In order to extract information about the lunar cycle from this text we need to ask: What does the epithet word of the text “sign” (אֶמְלָא) stand for?

When the *Otot*-text was introduced to the public for the first time, Milik discussed briefly his interpretation of the word’s function in the text. The word, Milik argued, bears no special meaning but functions as a copula with the priestly names for the determination of time units and feasts. When the 364-day calendar is incorporated with the twenty-four priestly courses, together they form the sexennial priestly cycle in which every sabbath, month, year, and other unit of time, and even festival and feast, can be seen as matched with a particular priestly course by having that course serving at the beginning of that time unit. This pairing of time unit with the priestly service provides a means for determining the unit by the corresponding priestly name. “Thus every sabbath, month, year, and likewise every feast, was determined by the

name of a priestly family; in other words they were under the ‘sign’, *’ôl*, of such a family”, quoting Milik.⁸¹ In this way Milik did not only see the word forming copulas with Gamul and Shecaniah in this text denoting triennial periods but he also generalised the word to cover other time units, for example, “The six years of sexennial cycle began with the signs, *’ôlôt*, of Gamul, Yeda‘yah, Miyamin, Sekanyah, Yesab‘ab and Ha-Poses.”⁸²

Based on Milik’s interpretation the word “sign” on its own has no special function but is always combined with a priestly name to denote a piece of time, which could be sabbath, week, month, year, or even jubilee⁸³. However, does the usage of the word in the text allow such an interpretation? There are three points against this interpretation. First, the suggested constructions “sign of Gamul” and “sign of Shecaniah” only occur in the *Otot*-text but not in the other Qumran texts. If a period of time is said to be under the “sign of Gamul” to mean that the period begins with the service of Gamul, then the phrase is applicable to any enumeration of other time units. Indeed in many of the Calendrical Documents time units, such as sabbath, month, quarter of year, year, are enumerated according to their corresponding priestly names, but not one of them puts the names with the word “sign” and none of them mention that the names are the “signs” of the periods. Second, the structure of the entries in the *Otot*-text suggests that the word “sign” is unlikely to be read together with the priestly names as a conjugated phrase. As a later discussion on the formula of the entries will show, the text is best understood with the word read as a discrete unit without being attached to other words. The priestly name and the word “sign” are side by side with each other in the entries; instead of them meaning “sign of the priestly name”, they are more likely to represent the appearance of the priestly family as constituting a condition for the occurrence of a sign. Third, the usage of the word in the summary statements of the *Otot*-text does not agree with this interpretation. The total number of signs counted in each jubilee is summarised at the end of the

⁸¹ Milik, *The Book of Enoch*, 62.

⁸² Milik, *The Book of Enoch*, 62.

⁸³ That is how Eisenman and Wise understand the text: that each jubilee is under the sign of either Gamul or Shecaniah. See their translation of the text in *The Dead Sea Scrolls Uncovered*, 130.

enumeration. Taking the fourth jubilee for example, the summary states that there are seventeen signs in the jubilee from which there are two signs on the release year. The free-standing of the word in the statement without attachment to the priestly names (signs 17 and signs 2) shows again that the word need not or should not be read in conjunction with the names.

Furthermore, the restatement of the total number of recurrences of the carefully counted signs in a jubilee in the summary statements strongly indicates that the sign is more than just an epithet of the enumerated period but represents something special which requires the text's painstaking calculation. The author of the *Otot*-text did not just want to enumerate successive triennial periods but tried to find answers for the question of how many signs there are in each jubilee. Thus the enumerated sign should have some particular meaning of its own to stand for a special event or phenomenon.

In searching for the event or phenomenon represented by the term "sign", it is unlikely that we can glean anything from the meaning of the word itself for it is too general and could refer to any event. Rather we have to turn for help to the content of the *Otot*-text and some other related documents. The first clue comes from the two recurring priestly names in the *Otot*-text. Out of the twenty-four priestly courses only Gamul and Shecaniah are repeated in the entries to mark the sign, and they are two of the six year heads of the sexennial priestly cycle. There must be something special about the years having Gamul and Shecaniah serving on the New Year's Day so that they are singled out from the rest of the priestly families to be repeatedly enumerated in this text. If only Gamul is associated with the "sign" one could think that the word may denote the day of the beginning of the sexennial cycle, but the presence of Shecaniah denies this possibility. The two names occupy the beginning of the first and the fourth year in the six-year cycle, exactly three years apart. Therefore "sign" must stand for something happening not only at the very beginning of the six-year cycle but also occurring right in the middle of it. So what makes these two days (the first day of the first and the fourth years) so special that the author had to describe them as "signs"? For the final clue to the answer we have to turn to 4Q320 and the *duqah*-text. From the *duqah*-text it is known that the triennial lunar cycle enumerated in

4Q320 is repeated twice to form a complete match with the sexennial priestly cycle. Therefore what happens with the moon on the first day of the first year will be repeated on the same day of the fourth year, and 4Q320 states that on this day the moon is full. Thus it can be deduced that the “signs” counted in 4Q319 denote the days when the full moon once again falls on the very first day of the years.

The complete *Otot*-text contains six jubilees, and with each jubilee equating to forty-nine years it covers a total period of 294 years. With each sign indicating a new beginning of the triennial lunar cycle, the text is generally regarded as recording the three-year period successively without intermission throughout the whole 294 years. This is most likely to be the case. However, in order to further develop this characteristic of the text into an understanding of the Qumran lunar reckoning it is still necessary to check the general assumption with evidence from the surviving text to remove any possible doubt. A complete *Otot*-cycle is laid out in the following table with data that can be verified by the surviving text listed in bold.

2nd jubilee		3rd jubilee		4th jubilee		5th jubilee		6th jubilee		7th jubilee ⁸⁴	
p. c.	year	p. c.	year	p. c.	year	p. c.	year	p. c.	year	p. c.	year
G	1	S	3	S	2	G	4	G	3	G	2
S	4	G	6	G	5	S	r	S	6	S	5
G	r	S	2	S	1	G	3	G	2	G	1
S	3	G	5	G	4	S	6	S	5	S	4
G	6	S	1	S	r	G	2	G	1	G	r
S	2	G	4	G	3	S	5	S	4	S	3
G	5	S	r	S	6	G	1	G	r	G	6
S	1	G	3	G	2	S	4	S	3	S	2
G	4	S	6	S	5	G	r	G	6	G	5
S	r	G	2	G	1	S	3	S	2	S	1
G	3	S	5	S	4	G	6	G	5	G	4
S	6	G	1	G	r	S	2	S	1	S	r
G	2	S	4	S	3	G	5	G	4	G	3
S	5	G	r	G	6	S	1	S	r	S	6
G	1	S	3	S	2	G	4	G	3	G	2
S	4	G	6	G	5	S	r	S	6	S	5
G	r			S	1						

Legend: G - Gamul; S - Shecaniah; r - release year

⁸⁴ For the order of the jubilees in the text see discussion in pages 300-302.

Although many of the data in the table need to be reconstructed, the sequence patterns revealed in the extant data form strong evidence that they are valid. Whenever the priestly names survive in two or more consecutive entries they are always alternating between Gamul and Shecaniah. Also when this alternating sequence of priestly names is fitted into the missing data of the entries they match exactly with the surviving ones. The order of the year number recovered from the surviving fragments also falls into a fixed pattern. Whenever two or more of these numbers are recovered in succession they always show part of the sequence 1-4-r-3-6-2-5, and when the missing data are filled in according to this sequence they form a perfect match with the extant figures. This number sequence reflects an enumeration of a three-year period over a cycle of seven years. With the confirmation of the validity of the reconstructed table, both lists of the priestly names and the year order verify that all the entries of the *Otot*-text follow one another with an uninterrupted period of three years. In other words, in the *Otot*-text the signs are regarded as an event recurring every three years continuously at least over a period of 294 years.

The continuous recounting of signs with a fixed interval of three years in 4Q319 demonstrates that the triennial co-ordination between the lunar cycle and the 364-day year is not a temporary measure or a rough representation of the lunar cycle which needs to be adjusted from time to time but an unchanged rule that lasts for a very long period of time at least, if not forever.

This continuity of the triennial lunar cycle in the *Otot*-text discloses another facet of the Qumran lunar reckoning: the lunar cycle in the Calendrical Documents is not a true representation of the natural cycle. The three-year model in the Qumran lunar related documents is a close approximation to the natural cycle but it is still on average a 0.017077 day short per lunation. The difference amounts to 0.63 day over three years time, and roughly 1.26 days over a period of six years. The discrepancy over these periods is relatively small and it would be difficult to notice through actual observation of the lunar phase change, so the model can still be regarded as following the true cycle over such periods. If the model was only found in 4Q320 covering a period of three years or in the *duqah*-text extending over a period of six years one

could still argue that this three-year model is adjusted in some way after six years in order to keep it in alignment with the actual cycle, but the evidence of the *Otot*-text rejects these speculations. The text locates the recurrence of the signs in every three years which implies that it perceives the return of the moon to its fullness at the beginning of the year occurring unfailingly once every three years. This repeated pattern is not expected to be disturbed for as long as at least 294 years. Within this confirmed period of continuity the discrepancy will cause the Qumran lunar reckoning to lapse more than two times around the natural cycle. With the regularity as such in the *Otot*-text the separation between the Qumran lunar reckoning and nature is evidenced.

Summary on the Qumran Lunar Reckoning

The research on understanding the Qumran lunar reckoning based on the evidence of the Calendrical Documents ends at the point on the departure of the Qumran reckoning from nature. Before the discussion moves on to the comparison between this Qumran lunar understanding with those in the *Jubilees* and *1 Enoch*, it is useful to recap what has been discussed and achieved so far on the Qumran reckoning itself:

1. It counts the lunar cycle in a regular alternating twenty-nine-day and thirty-day pattern, but the regular pattern is broken once every thirty-seven cycles.
2. It starts the enumeration of the cycle with the full moon.
3. It designates the new moon as “*duqah*” and locates it at either seventeen days (in a twenty-nine-day cycle) or eighteen days (in a thirty-day cycle) after the full moon.
4. The location of the new moon in the 37th cycle of the three-year period shows this cycle is a twenty-nine day cycle with one inserted extra day.
5. The three-year lunar cycle is best represented as: $18 \times 29 \text{ days} + 18 \times 30 \text{ days} + 29 \text{ days} + 1 \text{ day}$.
6. It enumerates the change of the amount of moonlight with a fourteen-step function.

7. It always reckons two dark moon days in each cycle with either one full moon day in the twenty-nine-day cycle or two full moon days in the thirty-day cycle.
8. It reckons the triennial lunar cycle in an uninterrupted manner for at least 294 years.
9. It does not exactly match with the natural lunar cycle.

COMPARISON WITH *JUBILEES* AND *1 ENOCH*

With the formation of a clearer picture of the lunar reckoning in the Calendrical Documents, we may now return to the question of the congruence and divergence of this set of documents with *Jubilees* and *1 Enoch* with respect to their lunar understanding. It is inadequate to set texts in opposing camps of different lunar precedence simply by whether they reckon the lunar cycle or not. For a more impartial classification it is necessary to go into the details of the lunar material in these texts to see whether they really agree or disagree with each other.

Jubilees

Despite being widely discussed in the debate over the lunar issue of the 364-day calendar, there are only a few passages in *Jubilees* concerning the moon and its cycle, and these passages provide very little information on the calculation of the cycle except for the writer's attitude about it. Lunar related material in this book comes mainly from three passages, *Jub.* 6:36-37, 2:9, and 4:21. On the whole they give the general impression that the role of the moon is deliberately played down and vehemently rejected whereas the sun's status is exalted. However, in order to go beyond this apparent position to a more accurate understanding of the book's opinion on the moon and its circuit, one has to ask more precisely: to whom was this polemic directed? Rather than concentrating on the relevant verses only it will be beneficial to extend the focus wider to take into consideration the subject of discussion of the sections where these verses are found.

The whole of chapter 6 is set against the background of Noah's sacrifice and God's covenant after the flood (cf. Gen 8:20-9:17). When Noah and his family emerged from the ark he built an altar and made atonement for the earth. When God smelt the good odour of the burnt offering He made a covenant with Noah that the earth would not be destroyed again by a flood. However, instead of recording this as an one-off event, *Jubilees* associates this event with the Feast of Weeks and appoints the festival as the time for annual renewal of the covenant. It is when stating the ordinance for the observance of this festival that the book gives an extensive section discussing calendrical issues. The whole calendrical section is set on the same tone as its preceding part which leads to its presence - the feasts and festivals have to be kept at exactly the right time of the year. In order not to disturb the sacred days the counting of the years must not go astray, and the only correct way of regulating the festivals is by fixing the year with exactly three hundred and sixty four days. It is only at this point that the lunar cycle is brought into the discussion as a warning of the danger of straying from the years and hence corrupting the sacred days. This is what *Jub.* 6:36-37 is all about. It is a warning against those who "make observations of the moon" for it will, the author of *Jubilees* states, "disturb the seasons and comes in from year to year ten days too soon", and more importantly because of this that people "will disturb (the order), and make an abominable (day) the day of testimony, and an unclean day a feast day, and they will confound all the days, the holy with the unclean, and the unclean day with the holy." Thus the polemic here is not aimed at the moon or its circuit but rather at those people who regulated the sacred days according to a calendar based on the observation of the moon. What occupies the centre stage in this calendrical section are the holy feasts and festivals, which need to be observed at the right time. In this respect it is more accurate to say that these verses are only objecting to the use of the moon in fixing the holy days.

This verse is part of an account retelling the creation story. It is only when this rewritten account is compared with the original story in Gen 1 that the changes made by the author are disclosed. In *Jubilees* the creation act on the fourth day is retold in three verses (Jub. 2:8-10), which can be separated into two parts. The first part (v. 8) is about the things that were created on this day and their general role and function, and the second part (v. 9-10) is about a special assignment concerning the sun. In the first part *Jubilees'* account is close to Gen 1:14-19. The only point worth mentioning about this part is that the writer has supplemented the original account with more specific terms. Instead of simply calling the things created "lights" now they are named more specifically as "the sun, the moon, and the stars". However, the functions assigned to them in Genesis remain unchanged - they were set in the firmament of the heaven "to give light upon all the earth, and to rule over the day and the night, and divide the light from the darkness." (cf. Gen 1:17-18) It is only in the second part that an obvious alteration is found. Whereas in Genesis the function of being "signs for seasons, for days and for years" is generally assigned to all the lights created on that day, in *Jubilees* the role is specifically appointed to the sun only. Yet can we infer from this alteration that the author's intention is to play down the role of the moon, and that it reflects his vehement rejection of the moon in general? The first part (v. 8) refutes such a deduction. The moon is listed alongside with the sun as part of the creation on the fourth day, and together they are provided with the same functions: giving light, ruling the day and the night, and dividing light from darkness. In this regard the moon is no less important than the sun as a part of God's creation. It is only when it comes to the function of time regulation that the sun is singled out as the sole sign for days, months, years and so on. Not only the moon but all the other heavenly bodies are denied this role of time regulator. Even though they are all part of God's wonderful creation and they share the functions that God generally assigned to the heavenly bodies, they play absolutely no part in the fixing of the days, years, and feasts. Therefore the singling out of the sun in v. 9 is only with regards to regulating times and fixing festivals but not for the other roles of the heavenly bodies. Thus the

verse should not be regarded as evidence of *Jubilees*' opposition to other texts which pay homage to the moon and its related phenomena as long as these texts do not take the lunar cycle as their base for counting days and fixing feasts.

Jubilees 4:21

There is no doubt in this verse that "the rule of the sun" is highlighted among the things which were shown to Enoch by the angels. This confirms the sun's special role in the transferred knowledge but what is this knowledge about? In *Jubilees* Enoch is regarded as "the first among men that are born on earth who learnt writing and knowledge and wisdom". (Jub. 4:17) Through a vision in his sleep Enoch learnt "everything that will happen to the children of men throughout their generations until the day of judgement", which he wrote down as "testimony on earth for all the children of men and for their generations." (Jub. 4:19) Among this vaguely mentioned testimony of everything, a few things are particularly mentioned as forming part, if not all, of the revealed knowledge passed down by Enoch. They are: (1) the signs of heaven according to the order of their months, (2) the weeks of the jubilees, (3) the days of the years, (4) order of the months, (5) the sabbaths of the years. (v. 17-18) From these we can perceive that the recounting of days, sabbaths, months, and years formed an important part of the knowledge made known to Enoch by the angels. It is in this scope that the rule of the sun is specified. Therefore the prominent notice given to the sun in *Jub.* 4:21 does not particularly raise its status over the other heavenly bodies but emphasises its role as the regulator of time - the role of the sun is for ordering the signs of heaven and the recounting of days and years.

The review of these three widely cited "anti-lunar" passages in *Jubilees* produces similar results. They are not anti-lunar at all for there is no particular hostility towards the moon itself or its related phenomena found in any of these passages. Their contexts are all about the regulation of time, and in this context they all conform to one single idea - there is only one rule in the sky which makes the reckoning of time exact, that is the rule of the sun. Although the lunar calendar is

singularly specified as a danger to the correct reckoning of time in *Jub.* 6:39, all three passages mean to safeguard their sacred calendar against any other form of calendrical reckoning. Outside the subject area of time setting the book shows no sign of polemic against either the moon or the stars.

In the light of the review of these passages one should not see any text as in opposition to *Jubilees* simply because it pays tribute to the moon or reckons the lunar cycle but rather one has to ask whether the text violates the strict calendrical call of *Jubilees* by following other calendars. The nature of the lunar element in the related Calendrical Documents is summarised below to check for their compliance with *Jubilees*' calendrical restriction.

Phases of the Moon (4Q317)

Calendrical base	- most probably the 364-day year
Lunar element	- enumeration of the daily amount of moonlight

The *Otot*-text (4Q319 1 iv-vi)

Calendrical base	- the sexennial priestly cycle (hence the 364-day calendar)
Lunar element	- enumeration of the recurrence of the coincidence between the full moon and the New Year's Day

The lunar section of 4Q320 (4Q320 1 i-iii)

Calendrical base	- the 364-day year and the sexennial priestly roster
Lunar element	- enumeration of the recurrence of the full moon

The *duqah*-text (4Q321 1 i-2 i, and 4Q321a)

Calendrical base	- the 364-day year and the sexennial priestly roster
Lunar element	- enumeration of the recurrence of the full moon and the new moon

With their calendrical base and lunar element listed, three points can be concluded about these lunar related texts:

- (1) The lunar cycle never functions as the calendrical base for recounting days, months, and years in these texts.
- (2) The various special moments of the lunar cycle are the objects of enumeration in these texts.
- (3) Beside the 364-day calendar and its related sexennial priestly roster there is no other form of calendar found or proven to exist in these texts.

Putting these conclusions alongside the findings on *Jubilees*' attitude towards the moon there should be no difficulties in realising that placing the lunar related Qumran Calendrical Documents in opposition to *Jubilees* is a mistaken assumption. On the one hand, *Jubilees* shows no sign of objecting to the moon or its phenomena other than its possible function as a time regulator. On the other hand, the Calendrical Documents never use the lunar cycle for regulating times, but are only concerned with its periodic changes and reckoning them according to the 364-day calendar. There is absolutely no disagreement or contradiction between the two.

1 *Enoch*

Unlike the case of *Jubilees*, the Qumran Calendrical Documents are usually considered as affiliated with *1 Enoch*, especially the *Astronomical Book*, on the grounds that lunar reckoning is found in both groups of texts. This assumed kinship even causes scholars to transfer information from one book to the other in trying to understand their assumed common calendrical system.⁸⁵ Undoubtedly both the *Astronomical Book* and the Qumran Calendrical Documents reckon the 364-day year and they both devote sections to discuss the lunar cycle. However, despite their agreement on a calendar with 364 days a year are their ways of reckoning the lunar cycle really the same? This can only be confirmed by comparing the details of their reckoning.

⁸⁵ A common example is to borrow the material in *1 Enoch* 72 in order to say that the Qumran Calendrical Documents have their years beginning in the spring with the vernal equinox.

The *Astronomical Book* is a complex collection of various astronomical treatises, with over half of its sections concerned with the lunar cycle. It is beyond the capacity and scope of this thesis to provide a detailed analysis of all its lunar related material. However, in order to facilitate the comparison, the main points of the lunar material in the various sections of the *Astronomical Book* are summarised to highlight the lunar reckoning of this composite book. This summary has included material not only from the Ethiopic version of the book (*1 Enoch* 72-82) but also from its Aramaic fragments found at Qumran (4QEnastr).

Main points on lunar reckoning in the *Astronomical Book of Enoch*:

1. The book reckons a lunar year of 354 days, and this number of days per year remains constant for at least eight lunar years. (74:14-16)
2. The 354-day year is equally divided into two halves of 177 days, each of which contains three thirty-day months and three twenty-nine-day months. (78:15-16; 79:3-4)
3. The moon's revolution produces the cycle of lunar months in which lunar days are counted accordingly. (73:4-8; 74:1-2; 4QEnastr)
4. The lunar months begin with the appearance of the new moon. (73:4; 78:12; 4QEnastr)
5. The daily light change on the moon is counted by a fourteen-step system, but there are various ways of presenting this method. It can be counted in one-part steps of one-fourteenth part of the total moonlight (78:7-8), or in half-part steps of one-seventh part of the total moonlight (74:3; 78:6; 4QEnastr), or even in half-part steps of one-seventh of one-seventh part of the total sunlight (73:3-8).
6. In the lunar monthly cycles the phase change of the moon follows these patterns:
 Full month - waxing from day 1 to day 14, and waning from day 15 to day 28.
 Hollow month - waxing from day 1 to day 14, and waning from day 16 to day 29.
 (4QEnastr)⁸⁶

⁸⁶ Based on the information provided by Milik in *The Book of Enoch*, 283, and by Tigchelaar and García Martínez in *DJD* 36, 97-99

7. The position of the rising and setting of the moon is measured in terms of “gates”, the same system as applied to the rising and setting of the sun. (73:4; 74:5-9; 78:5; 79:2-4; 4QEnastr)

Once the main points about the lunar reckoning in the *Astronomical Book* are summarised and listed, the apparent affiliation between the calendrical systems in *I Enoch* and the Qumran Calendrical Documents is immediately put to the test. In fact other than that they both have the lunar cycle as their subject of enumeration there are only a few common points between the two in the actual details of their reckoning.

Similarities between the Qumran Calendrical Documents and 1 Enoch in Lunar Reckoning

Since the natural lunar cycle forms the common base of their reckoning, it is no surprise to find that the two sets of books are similar to each other in some basic aspects, such as counting the cycle period in either twenty-nine or thirty days, or seeing the moon waning and waxing in each half of the cycle between the full moon and the dark moon. Beyond these basic common areas their resemblance in two particular areas is worthwhile enough to be mentioned, namely the method for counting the moonlight change and the pattern of light change in the cycles.

Method for Counting the Light Change of the Moon

A fourteen-step system is found in the both sets of texts for calculating the light change on the face of the moon. The counting of moonlight is found in several sections of the Ethiopic version of *I Enoch* (in chapters 73, 74, and 78), and in the Aramaic fragments (4QEnastr^{a&b}), and they all follow the fourteen-step method, although it is expressed in different forms. Among the Calendrical Documents only one manuscript does this, that is 4Q317, “Phases of the Moon”. Right from its disclosure to the public this manuscript’s close connection with the *Astronomical*

Book was established through this method of describing the phases of the moon.⁸⁷

Without doubt the same fourteen-step method is employed in this manuscript, and this resemblance in the enumeration method, which is otherwise unknown, undeniably attests to a link between this text and the *Astronomical Book*. However, the use of this method is not sufficient to guarantee that the two are agreed on the other aspects.

Pattern of Light Change in the Lunar Cycles

According to Milik's study on the fragments of 4QEnastr the daily light change of the moon in this text follows a regular pattern:

During the first 14 days of each lunar month, the moon waxes from one half of the seventh part of its light up to the full moon, thus from $1/2$ to $7 = 1/14$ to $14/14$. In the second half of each month, on the other hand, it wanes from $1/14$ to $14/14$ (= astronomical new moon) between the 16th and the 29th of each month composed of 30 days, and between the 15th and the 28th day of each month composed of 29 days.⁸⁸

Unfortunately, no entry for either the 15th or the last day of the months is preserved completely in the fragments, so it is not known how many parts of light are designated to the moon for these days. However, we can presume that the day after the moon reaches its fullness and before it starts to wane (this only happens with the 15th of the thirty-day months) shall retain a full moon, and the day after the moon attains the astronomical new moon and before it reappears again (this applies to the 29th of the twenty-nine-day months and the 30th of the thirty-day months) shall retain an invisible moon. Based on this presumption and Milik's finding we can infer that in 4QEnastr

⁸⁷ The manuscript was first introduced by Milik in *The Book of Enoch*, 68-69, when he stated "To return to the Qumran manuscripts, we should note finally that there is only one astronomical text which closely recalls the lunisolar calendar found at the beginning of the *Astronomical Book of Enoch*. This is a Hebrew text copied in cryptic writing (4QAstrCrypt = 4Q317) ... In it the phases of the moon are described, on a scale of fourteenths of the area of the full moon".

⁸⁸ Milik, *The Book of Enoch*, 283.

there are always two days of dark moon in every month (i.e. the 28th and the 29th of the twenty-nine-day months or the 29th and the 30th of the thirty-day month), and there are two days of full moon in the thirty-day months (i.e. the 14th and the 15th) but there is only one day of full moon in the twenty-nine-day months (i.e. the 14th). These numbers of full moon and dark moon days are the same as the proposed model of light changing pattern in 4Q317.⁸⁹ This finding helps to reinforce one's confidence in the proposed reading of 4Q317, and it also points to a possible link between the two collections of texts. However, the similarity on this point may have its significance, but it does not constitute any proof for the identity of their lunar reckoning.

Differences between the Qumran Calendrical Documents and 1 Enoch in Lunar Reckoning

Other than the mentioned similarities, the two sets of texts are different in many major aspects of their lunar understanding which have inevitably separated them from one another.

Lunar Cycle as Calendrical Base

In the Calendrical Documents the lunar cycle only functions as the object of enumeration but is never regarded as a calendrical base. There is no evidence that the documents ever arrange the lunar cycles into years, or regard the lunar cycles as months, or even count the days according to the lunar cycles. However, in *1 Enoch* a fully developed lunar calendar is found. It reckons a lunar year of 354 days, and it divides the year into twelve lunar months. In addition in various sections days are found counted by their order in the lunar months. Obvious examples of the operation of a lunar calendar in *1 Enoch* can be found in the entries of 4QEnastr. Quoting a line from Milik's translation as an illustration: "And at the (beginning of) night twenty-five

⁸⁹ cf. page 263.

of this (month, the moon is covered to five seventh (parts of its light, i.e.) five seventh (parts) are subtracted from its light.”⁹⁰ The co-ordination between the date and the amount of moonlight in the entries shows that the dates in this text are based on a lunar calendar. Such a counting is definitely not found in the Qumran Calendrical Documents.

Length of the Lunar Cycle

In the Calendrical Documents the lunar cycle is perceived as falling in perfect alignment with the 364-day year in a three-year period which gives it an overall average length of 29.513513 days. In the *Astronomical Book* whenever the length of the lunar year is inferred it is always 354 days. With twelve lunar months in a year, each month is rounded up to an average of 29.5 days. The rigidity of this exact year length is expressed most explicitly in *1 Enoch* 74:10-17 where it is compared with the solar year of 364 days. The passage maintains the consistency of 354 days a lunar year for periods of three, five, and eight years: “so that for the moon the days in eight years amount to 2832 days [= 8 x 354 days].” (74:15) Whether this rigid number of days is meant to be maintained forever or not is unsure, but at least for a period up to eight years it is unchanged. This comparison in 74:10-17 shows that in the *Astronomical Book* the lunar cycle is not adjusted to ensure alignment with the 364-day yearly cycle, not in three years time, nor in five or eight years.

Phase of the Moon at the Beginning of the Lunar Cycle

In the Calendrical Documents the lunar cycle is not reckoned as a calendrical unit but as a repeating phenomenon. Without specific order designated to the days in each cycle it is difficult to tell in these documents when the lunar cycles begin. However, they do regard an absolute beginning for time reckoning with the moment of creation. Hence a beginning for their lunar cycles can still be fixed from this perspective. The

⁹⁰ 4QEnastr^b 7 ii 6 in Milik, *The Book of Enoch*, 280.

starting point for all the calendrical enumerations in these documents is the fourth day of the creation week, and on this day the moon appeared in its fullness. Therefore we can relate that the Calendrical Documents start the reckoning of the lunar cycle with a full moon. For the *Astronomical Book* the case is much simpler. Since the moon's revolution produces the lunar months, there is a specific starting point for each lunar cycle, that is the first day of the corresponding lunar month. The *Astronomical Book* is explicit on the lunar phase for the monthly beginning - "On the first day it is called New Moon because on the day light appears on it (for the first time)."⁹¹ The entries of 4QEnastr^{a&b} and the section on enumerating the amount of moonlight in *1 Enoch* 73:4-8 all point to the same result: in the *Astronomical Book* the lunar cycle begins with the appearing of the new moon. This constitutes a major distinction between the lunar reckoning of the *Astronomical Book* and the Qumran Calendrical Documents.⁹²

Fixing the Lunar Cycle on to the Solar Calendar

Since the lunar cycle is aligned to the 364-day year in a three-year period in the Calendrical Documents it is possible to map the lunar phase against each day of the year. Some of these documents (4Q320, 4Q321 and 321a) do firmly fix the lunar cycle onto the 364-day calendar by marking all the dates for the recurrences of specific lunar phases. By them one can tell precisely what phase the moon is in for each day of the three-year period. It is unclear whether there is such a correspondence between the lunar months and the solar years in *1 Enoch*. Even if it does exist the period for the two to be in alignment is not known unless one superimposes indiscriminately the three-year cycle of the Qumran documents onto the Enochic

⁹¹ *1 Enoch* 78:12, translation of Neugebauer in "The 'Astronomical' Chapters", 409.

⁹² Somehow this is regarded by some scholars as the only difference in lunar reckoning between the two groups of texts. For example, see VanderKam, *Calendars*, 111.

books. In his study on the Aramaic fragments of the *Astronomical Book* from Qumran Milik announced his discovery of such a correspondence.⁹³

The key to the correct interpretation of the calendar detailed in Enastr^{a and b} is found at iii 1-2 (and 5-6). We read here that on the eighth of a month, not otherwise specified, the sun completes its movements on the ‘sections’ of the first gate and the morning after it rises again from the first gate. This is thus a reference to the end of the 9th solar month and the beginning of the 10th; see En. 72:25-7. Now, the first day of the 10th solar month, in a year made up of 364 days, falls exactly on the eighth day of the 10th lunar month (the 8th Tebeth) in a lunar year composed alternately of months of 30 and 29 days.⁹⁴

If Milik’s interpretation is correct then we do have a reference point for the mapping between the lunar and the solar year in the *Astronomical Book* - 1/10 (solar year) = 8/10 (lunar year). However, even accepting Milik’s interpretation for the moment does this information of the *Astronomical Book* match with the mapping system in the Qumran Calendrical Documents? According to the calculation of the *Astronomical Book* 1/10 of the lunar year is when the new moon appears, so 8/10 of the lunar year (equivalent to 1/10 of the solar year) is the seventh day after the new moon. From the *duqah*-text we can locate the *duqah* (new moon) in the ninth month and hence count the number of days between this *duqah* and the coming 1/10 in all three years of the triennial cycle. And the results are:

Year	<i>duqah</i> in the 9th month on	1/10
First	11/9	the 21st day after the <i>duqah</i>
Second	31/9	the next day after the <i>duqah</i>
Third	21/9	the 11th day after the <i>duqah</i>

⁹³ Milik’s assumption is based on that the Synchronistic Calendar of the *Astronomical Book* is a triennial synchronism of a lunar year of 354 days and a solar year of 364 days. (Milik, *The Book of Enoch*, 274-284, esp. 274)

⁹⁴ Milik, *The Book of Enoch*, 282-283.

The datum of correspondence found by Milik does not agree with any one of the three years. So even if Milik's understanding of 4QEnastr^{a&b} is right, the method of mapping the lunar cycle onto the 364-day year is different between the *Astronomical Book* and the Qumran Calendrical Documents.

The comparison between the details of the lunar reckoning in the Qumran Calendrical Documents and in *1 Enoch* ends with a result which is quite different from the generally accepted perception. Whereas most scholars would assume that the calendrical system underlying the two sets of texts is the same and therefore transfer information freely from one to the other, this detailed comparison puts the close relationship of the two into question and delivers a warning on the dangers of the indiscriminate gathering of information. Despite the fact that they both uphold a 364-day year and have the lunar cycle as part of their enumeration, the lunar reckoning in these books are basically different. They differ in the role they give the cycle and also in the principle of their calculation. Whilst the Qumran Calendrical Documents regard the lunar cycle as a phenomenon to be reckoned against the 364-day calendar, the *Astronomical Book* is more willing to use the lunar cycle as an operation tool for regulating a calendar. Although similar methods for representing the lunar cycle are presented in both texts, their difference in the computation of the cycle's length and its starting phase differentiates two in principle. In addition the mismatch in the data for mapping the lunar cycle to the 364-day calendar discloses that the two are actually working with different operating systems.

To conclude the section on the comparison of the Qumran lunar reckoning with those in the pseudepigraphal books the review generated a result which turned the usually assumed picture on its head. It shows that the apparent opposition of *Jubilees* against the lunar related Qumran Calendrical Documents is unfounded, and the apparent close relationship between these documents and *1 Enoch* is unreliable. The difference between *Jubilees* and *1 Enoch* in their attitudes towards the lunar reckoning is clear. However, if the lunar material found in the Qumran Calendrical

Documents has to be put into either camp, it is more likely to be on the side of *Jubilees* rather than with *1 Enoch*.

Conclusion

Being a later discovered source of a peculiar calendrical system, the study of the Qumran calendar has inevitably come under the influence of the earlier known source - the Pseudepigrapha. This influence in the respect of lunar reckoning has been immensely strong. In order to acquire an unbiased understanding of the lunar reckoning of the documents themselves, the Qumran Calendrical Documents had to be isolated from the Pseudepigrapha and studied on their own. Among the eighteen scrolls five manuscripts were confirmed as having a lunar connection. Based on their lunar material a picture of the Qumran lunar reckoning was thus formulated. By looking at various aspects of the lunar cycle the reckoning was able to be understood from its minute day to day lunar phase change to its long-term operation. The picture assembled of this lunar understanding was a highly schematic one. Its lunar cycle follows an alternating twenty-nine-day and thirty-day pattern in general, but when the alternating pattern comes close to the 364-day year by the end of a three-year period it is fitted into the yearly cycle by the insertion of an extra day. The triennial co-ordination between the lunar cycle and the 364-day year is best represented by a simple formula: $364 \text{ days} \times 3 = 18 \times 29 \text{ days} + 18 \times 30 \text{ days} + 29 \text{ days} + 1 \text{ day}$. During the search for the structure of the lunar reckoning an important aspect of these lunar related Qumran scrolls was discovered, that is that they only regard the lunar cycle as their object of enumeration but never take it as the tool for calendrical regulation. When the acquired picture of the Qumran lunar reckoning was compared with the pseudepigraphal books an intriguing result emerged: the generally assumed relationship between these source materials of the 364-day calendar was in fact turned around. Firstly, the apparent opposition between the Qumran Calendrical Documents and *Jubilees* was proved to be a false assumption. There exists no contradiction or disagreement between the two with regard to lunar reckoning. Similarly, the apparent close relationship between these documents and the *Astronomical Book of Enoch* was

also shown to be untrue. The two do not only provide different roles for the lunar cycle, but also their reckoning of the cycle is totally different from each other. This extensive research on the lunar reckoning of the Qumran Calendrical Documents has achieved two important results: (1) it provides a clear and independent report on the lunar reckoning of these documents; (2) it reshapes the relationship between these documents and the pseudepigraphal books based on their understanding and attitude of the lunar cycle.

CHAPTER 5

THE QUMRAN CALENDRIAL DOCUMENTS AND THE PROBLEM OF INTERCALATION

The characteristic feature of the 364-day calendar, that is its particular number of days in a year, causes great debate about the nature of the calendar: is its year intercalated to match the true solar cycle? A 364-day year is about one and a quarter days shorter than the time that takes for the earth to travel around the sun once.¹ If no intercalation is carried out, it will then shift forward from the natural cycle year by year.

Since the true solar cycle is not composed of a complete number of days, calendars intended to have their years fixed with the solar cycle have to settle anyway with a close approximate number of days for their year, and then adjust periodically to bring in the alignment. However, not every calendar possesses such an intercalation scheme,² so one cannot automatically say that there should be one to bring the years of the 364-day calendar into agreement with the cycle of the sun. Since the discovery of the 364-day calendar some people have assumed the agreement and tried to find the method, but some others have insisted on its absence. The divergence of scholarly opinion over the issue of intercalation with the 364-day calendar has existed from the early days of the discovery right up to the present.

Confined as it is to the scope of this thesis, this chapter is not intended to be an extensive discussion covering every aspect on the issue of intercalation with the 364-day calendar but rather it will focus on the significance and contribution of the Calendrical Documents on the issue. Nevertheless in order to pinpoint the function of these documents in the discussion it is helpful to give a brief account on the history of

¹ A mean solar year, also known as the tropical year or the equinoctial year, has 365.24220 days. It is measured by the time between two successive occurrences of one of the tropics, usually the vernal equinox. If one is looking at the celestial sphere, it can also be defined as the time between two successive passing of the sun across the celestial equator when moving northward.

² Examples of calendars not aligned with the solar cycle are the ancient Egyptian calendar and the Muslim calendar.

the development of the issue and to list both the for and against arguments of the case.

Progress of Intercalating the 364-day Calendar

The discussion on the problem of intercalation with the 364-day calendar did not start with the discovery of the Qumran Scrolls. As early as 1930 a proposal had already been made for the intercalary method with the 364-day calendar of *Jubilees*.³ Discovering at Qumran texts containing a calendar similar to the one in *Jubilees* rekindled the interest of scholars on this peculiar calendar and gave them fresh material to advance its study. In the early years of the Qumran discovery scholars, in general, had assumed the calendar was somehow intercalated to match with the true solar cycle. This general assumption is best illustrated by the question put forward by Milik. In the section “The Calendar and the Feasts” of his book *Ten Years of Discovery in the Wilderness of Judaea*, after describing the Qumran calendar in general Milik raised two questions about it:

The calendar used by the authors of *Jubilees* and *I Enoch* and by the settlers at Qumran and by the camps of the Land of Damascus presents two problems: Where did it originate? How was it synchronized with the astronomical year?⁴

Illustrative enough the second question is not on whether the calendar was intercalated or not but rather on how it was done. After putting forward the questions and admitting the absence of material for solving the second problem Milik then proposed his own scheme of intercalation. Under the same general assumption, numerous plans of intercalary methods were proposed at this stage varying from

³ S. Zeitlin, “Notes relatives au calendrier juif,” *Revue des Etudes Juives* 89 (1930) 349-359.

⁴ Milik, *Ten Years*, 110.

supplying the extra days once every year to as long as every 49 years.⁵ Despite their accord on the general assumption, there was no consensus reached about these theories on how the synchronism was done. Besides the various proposals there were also voices raised against the case of intercalation at this stage but they were relatively sparse.⁶

When the momentum for the release of the unpublished Qumran Scrolls receded during the 60's and through to the 80's the heat of the discussion of calendrical issues also subsided. However, works concerning the problem of intercalation still appeared from time to time during the thirty years of the inert period. The general feeling of the presence of intercalation lingered on⁷ but the objecting voice was also able to be heard.⁸ Without new material supplied for the discussion, the case did not move any further during this stage but remained stagnant. More proposals for the intercalary method were made based on the general assumption and the objections to it were mainly due to the lack of clear evidence.

⁵ For intercalation schemes proposed in this stage see, among others, Jaubert, "Le calendrier"; E. Vogt, "Antiquum kalendarium sacerdotale," *Biblica* 36 (1955) 405-407; P. W. Skehan, "The Date of the Last Supper," *Catholic Biblical Quarterly* 20 (1958) 192-199; A. Strobel, "Der Termin des Todes Jesu. Übersicht und Lösungsvorschlag unter Einschluss des Qumrankalenders," *Zeitschrift für die neutestamentliche Wissenschaft* 51 (1960) 88-94; M. Testuz, *Les Idées religieuses du livre des Jubilées* (Genève: Droz, 1960); E. Kutsch, "Die Solstitien im Kalender des Jubiläenbuches und in Äth-Henoch 72," *Vetus Testamentum* 12 (1962) 205-207. Brief descriptions of these intercalary procedures can be found in Beckwith, "Modern Attempt", 379-381; and VanderKam, "The Origin", 406-407, note 58.

⁶ For examples see J. B. Segal, "Intercalation and the Hebrew Calendar," *Vetus Testamentum* 7 (1957) 250-273, 251; and K-G. Kuhn, "Zum essenischen Kalender," *Zeitschrift für die neutestamentliche Wissenschaft* 52 (1961) 65-67.

⁷ For examples see H. Burgmann, "Die Interkalation in den sieben Jahrwochen des Sonnenkalenders," *Revue de Qumrân* 10 (1979) 67-81; and A. R. C. Leane, *The Rule of Qumran and its Meaning* (London: S.C.M., 1966).

⁸ An article solely devoted to the discussion of the problem of intercalation with the 364-day calendar was published by Beckwith in 1970 ("Modern Attempt"). In this article Beckwith not only refuted various intercalary proposals by pointing out the flaws in the individual proposals but also gave general objections on why he thought the calendar was not intercalated.

Into the 90's following the revival of interest in the Qumran Scrolls with the full publication of the Cave IV fragments, the discussion on the calendar became lively again. Among scholars engaging in the subject, a few were particularly interested in the topic of intercalation and they have exerted considerable influence in shaping the course of the discussion. VanderKam, in formulating his view of the historical context of the scrolls, which had the calendars and the calendrical conflict at the centre of its theory, argued strongly for the case of intercalation.⁹ Glessmer and Albani were more focused on the calendrical and astronomical background of the calendar. While searching for the connection of the calendar with Babylonian astronomical science they both favoured the case of intercalation and tried to draw new material from the Qumran discovery to support their arguments.¹⁰ In particular new intercalary schemes were developed by Glessmer based on the Qumran manuscripts. However, the debate did not stop with these new materials and arguments. Still there are scholars strongly arguing against the case. Like Ben Zion Wacholder and Sholom Wacholder they reject any form of intercalation with the 364-day calendar by also using material from the Qumran scrolls.¹¹ The non-intercalation option at this stage has also drawn support from scholars such as Stegemann and Martone.¹²

⁹ VanderKam's view on the question of intercalation can be found in several of his works, VanderKam, *Calendars*, 82-84; VanderKam, *The Dead Sea Scrolls Today*, 114-116; in particular VanderKam, "The Origin", 405-407; and VanderKam, "Calendrical Texts", 377-379 & 384-386.

¹⁰ Glessmer and Albani jointly published an article, "An Astronomical Measuring Instrument", which forms an important part of their argument in supporting the case of intercalation. For their individual works related with intercalation see Albani, "Die lunaren Zyklen"; *Astronomie und Schöpfungsglaube: Untersuchungen zum astronomischen Henochbuch* (WMANT 68; Neukirchen-Vluyn: Neukirchener Verlag, 1994); "Zur Rekonstruktion eines verdrängten Konzepts: Der 364-Tage-Kalender in der gegenwärtigen Forschung," in M. Albani, J. Frey, and A. Lange (ed.), *Studies in the Book of Jubilees* (Texte und Studien zum Antiken Judentum 65; Tübingen: Mohr Siebeck, 1997) 79-125; and Glessmer, "Der 364-Tage-Kalender"; "Investigation"; "The Otot-Texts"; "Calendars".

¹¹ Wacholder and Wacholder, "Patterns of Biblical Dates", 28-37.

¹² C. Martone, "Some Observations on the New Mishmarot Texts from Qumran," in D. W. Parry and E. Ulrich (ed.), *The Provo International Conference on the Dead Sea Scrolls: Technological*

Arguments For and Against the Case of Intercalation

Over seventy years the debate on whether the 364-day calendar was intercalated has never reached any firm conclusion. Every time new material and information on the calendar was released the debate was rekindled, but it always, more or less, ended up with the same inconclusive result. So what are the arguments used by scholars to support either side of the case? And why are these arguments not able to convince the advocates of the opposite camp to give up their claims? The major points of argument for both sides of the case are listed below to demonstrate the difficulty in reaching a firm answer for the question.

Arguments For Intercalation

1. Practicability

If the calendar was practically used in the past then it must have been intercalated to suit the natural cycle. If the calendar was an ancient tradition which had been long practised by the Israelites then there should be no question about the calendar being intercalated. Even if it was not, the evidence from the Qumran Scrolls still proves that the calendar was utilised by at least the people at Qumran for over two hundred years. In that case intercalation must have occurred.

2. Biblical Festive Ordinances

According to the statutes in the Hebrew Bible some festivals are firmly tied to particular seasons of the year, for example the Passover with the vernal equinox, and the Festival of Booths with the autumnal equinox. Also some festivals, such as the first-fruit festivals, require the offering of seasonal produce from the earth. This demands the festivals to be matched with the agricultural cycle. If the 364-

Innovations, New Texts, and Reformulated Issues (Studies on the Texts of the Desert of Judah 30; Leiden: Brill, 1999) 443-449, 448-449.

day calendar was not intercalated it would inevitably depart from the seasons and there is no way for the observants of this calendar to comply with the biblical laws.

3. Parallel Case from the Babylonian Astronomical Texts

There are similarities between the 364-day calendar and the Babylonian astronomical texts, MUL.APIN, showing the connection of the Jewish 364-day calendrical tradition with Mesopotamian science and probably also the origin of this Jewish development. In the Babylonian texts a year of 364 days is also reckoned, but there are as well sections providing details on how the idealised year is intercalated to match with the real cycle. This parallel case strongly suggests that the same also occurred with the Jewish 364-day calendar.

4. Evidence from the *Astronomical Book of Enoch*

There are sections in the *Astronomical Book of Enoch* which clearly show that the 364-day year employed by the book is matched with the seasons. In *1 Enoch* 72 where the length of day and night in each month of the 364-day year is enumerated, both the location of the sun's rising and setting and the day/night ratio show that the calendar is season compliant. Also in *1 Enoch* 82 when the calendar is seen in conjunction with the movement of the heavenly hosts, the four intercalary days are specified as the leaders of the four quarters of the year and with each of them is a particular season.

5. An Astronomical Instrument found at Qumran

A stone disc found at Qumran is identified by Glessmer and Albani as an astronomical instrument with various functions, and one of its functions is for the determination of the four cardinal points of the year, that is the two equinoxes and the two solstices.¹³ This finding points to the fact that the people at Qumran did

¹³ Glessmer and Albani, "An Astronomical Measuring Instrument". For other possible interpretations of the instrument found see note 41 on page 20.

practically seek the times of the seasons, and hence their calendar could not possibly be one that totally ignored the natural cycle.

Arguments Against Intercalation

1. Lack of Indication for Intercalation

No text has ever been found describing a method of intercalation for the 364-day calendar, nor even hinting at the existence of such a method. The silence of the 364-day calendrical texts on the subject of intercalation strongly suggests that there never was any attempt to even out the difference between this calendar and the natural cycle. All the methods of intercalation proposed are without concrete textual evidence, and they are, frankly, no more than conjectures.

2. The Exact Number of 364 Days in a Year

That the year has exactly 364 days, no more and no less, is time and again emphasised in various texts of the 364-day calendar (e.g. *1 Enoch* 74:10, 12, 75:2 and 82:6; *Jub.* 6:32, 38; 4Q252 2:3; 11QPs^a 27:6-7; 4QMMT A.2). Any adjustment to co-ordinate the natural cycle by adding days, weeks, or months would be seen as a violation to the character of the calendar implicated in these statements.

3. Strict Observance of the Calendar

Passages like *Jub.* 6:32 and 1QS 1:14-15 forcefully stress the importance of observing the correct calendar and keeping the festivals at their right appointed time. They are not allowed to advance or retreat even one day. Therefore any adjustment to the calendar would inevitably disturb the feasts and festivals so that they would be regarded as abominations.

4. Rigidity of the Closely Knitted Cycles

The Qumran calendrical texts contain cycles of different periods. These cycles are so tightly intertwined that they resist any manipulation to the well-formed

structure of the calendar. These cycles include, from the shortest to the longest ones, the weekly sabbath cycle, the 13-week quarterly cycle, the 52-week yearly cycle, the triennial lunar cycle, and the sexennial priestly cycle. Together they make it impossible for the 364-day year to be adjusted within the six-year period without disrupting them. Any intercalation proposal neglecting any one of these cycles would be rejected by the calendrical texts.

5. A Theological Explanation

1 Enoch 80:2-8 describes a time when the natural phenomena will not appear at their appointed times and even the heavenly bodies will wander away from their ordained paths. The situation described in this passage fits well as a theological explanation for people following a non-intercalated 364-day calendar. For the fervent observers of the calendar when they maintained their years constantly with only 364 days they would inevitably end up with the separation of their calendar from the seasons. Yet, they did not see the fault as with their calendar but rather put the blame on nature; it was the world that went wrong trespassing its prescribed orders due to human sinfulness. Therefore it was their duty to hang on to their revealed truth until the end of days when the heavens astray would be restored to their ordained situation. For these people it would be an absurd idea to intercalate the calendar to match with the seasons.

Scholars are divided over the issue of intercalation of the 364-day calendar. People on either side of the debate have tried hard to search for clues to support their case. However, since most of the arguments or evidence gathered by both sides, as listed in the above, are either circumstantial, indirect, or based on uninvestigated assumptions, despite the insistence and perseverance of scholars neither side has gained the upper hand in the debate. Under the circumstances any research which could provide direct evidence for the case would no doubt tip the balance and have the final say on this critical issue of the calendar. Glessmer's work on a particular Qumran text is considered, at least by some scholars, as promising to produce a result of such a capacity.

Having been assigned the editorship of 4Q319 (4QOtot), Glessmer has published several papers on the preliminary findings of his work on the manuscript, which modify the misreading and some of the problems made by Milik, the original editor of the text.¹⁴ However, Glessmer's interest in the text did not begin with the assignment of its editorial work. Years before he had already started to engage with the analysis of the document based on the partial information disclosed by Milik.¹⁵ Right from the beginning of his study Glessmer had already seen that the enumeration of the text with its long span cycles could be a perfect tool for regulating intercalary schemes to the shortened 364-day year, and based on information extracted from the text he has made various proposals for the intercalation method. Glessmer is cautious about the validity of his proposals,¹⁶ but he maintains that: "If hints of intercalation are contained in Scrolls at all, 4QOtot needs to be discussed as evidence",¹⁷ and sees the text as "the only text in some way concerned with the long-term adjustment or recording of the lunation at the vernal equinox, and thus possibly with a type of intercalation."¹⁸ Still waiting for his final report in the official *DJD* series, scholars have already welcomed Glessmer's work as "a textual based proposal"¹⁹ for solving the problem of intercalation with the 364-day calendar.

As a work aiming at examining the time reckoning system of the Qumran Calendrical Documents it is mandatory for this thesis to evaluate the validity of the claim that textual evidence for intercalating the 364-day calendar can be found among these documents. This chapter will focus on 4QOtot and its related intercalary schemes proposed by Glessmer in order to resolve a crucial aspect of the Qumran calendar: is the calendrical arrangement confirmed so far meant to be adjusted from time to time to make it align with the true solar cycle?

¹⁴ Glessmer, "Investigation" ; "The Otot-Texts".

¹⁵ Glessmer, "Der 364-Tage-Kalender".

¹⁶ Quoting Glessmer's words: "It must be emphasised that this interpretation of 4QOtot is still in the realm of hypothesis". (Glessmer, "The Otot-Texts", 157)

¹⁷ Glessmer, "Calendars in the Qumran Scrolls", 264.

¹⁸ Glessmer, "Calendars in the Qumran Scrolls", 265.

¹⁹ Vanderkam, "Calendrical Texts", 377.

Despite the fact that it can be reconstructed almost completely 4QOtot is not easy to read for there are difficulties with both its extant and reconstructed texts in understanding its content. Therefore, instead of simply extracting information from the text to discuss the possibility of finding an intercalary scheme a closer look at the text itself is called for to avoid the danger of building ideas upon unfounded assumptions. The study of the text will be conducted by asking five questions on both its recording style and its enumeration method:

- How should the individual entry be read?
- Do the summary statements belong to the preceding or the succeeding jubilee?
- How does the text number the six jubilees?
- When does a jubilee end?
- How many signs are there in each jubilee?

Hopefully by investigating these problems, the overall structure of the whole text can be understood, or at least an appropriate awareness of the difficulties in understanding and interpreting the text can be developed.

How should the individual entry be read?

A standard recording entry of the *Otot*-text consists of three elements: (1) a priestly course, either Gamul or Shecaniah, (2) the word “sign” (אֵימָה), (3) a temporal element expressed by either an ordinal number from two to six or the word “release” (שְׁמִטָּה). In some entries an extra word “year” (שָׁנָה) is added to element 3, which reveals that either the number or the word refers to the yearly order of the seven-year release cycle. Whilst the word in element 2 is consistent throughout, elements 1 and 3 change from entry to entry. There is no dispute among scholars about the changing sequence of either the priestly name in element 1 or the yearly order in element 3, but they do disagree on the division of the entries.

When the text was first published by Milik, he took the formula of the entries as: yearly order + sign + priestly course. Taking the first few lines of the passage cited by Milik as examples, his reading of the entries ran, “[In the second (year)], the sign of Gemul. In the fifth (year), the sign of Sekanyah: after the Release (*semittah*), the sign [of Gemul. In the fourth (year), the] sign of Sekanyah; at the Release, the sign of Gemul. ...”.²⁰ This arrangement of the entries was adopted in some translations.²¹ When Glessmer took over the editorship of the text he argued against this reading and proposed an alternative by putting the temporal element at the end of the entries.²² Based on Albani’s suggestion, Glessmer pointed out that Milik had started the example passage with an erroneous beginning. Two words “Shecaniah in the year” (שְׁכַנְיָה בַשָּׁנָה) were missed out at the beginning of Milik’s quotation. Once the words were put back into the passage the structure of the entries was changed to: sign + priestly course + yearly order. When a single entry is concerned, this alternation does not seem to be very different from the original reading. In fact it transforms the structure of the entire text by shifting the number attached to the priestly course. Taking the same few lines listed above as examples, Glessmer’s proposal would reshape them as, “Shecaniah in the second year. The sign of Gamul in the fifth (year). The sign of Shecaniah after the release. The sign of Gamul in the fourth (year). The sign of Shecaniah in the release. ...”. The full publication of the text has supported Glessmer’s revision. The opening sentence for two other jubilee cycles can be found in 1 iv 8 and 1 v 3, and they both show that the text puts the priestly name in front of the yearly order.²³

Undoubtedly, Glessmer’s revision is an improvement on Milik’s initial reading, but this revision needs to be further modified by a third way of dividing the entries:

²⁰ Milik, *The Book of Enoch*, 62.

²¹ For examples Eisenman and Wise, *The Dead Sea Scrolls Uncovered*, and García Martínez, *The Dead Sea Scrolls Translated*.

²² Glessmer, “Investigation”.

²³ Glessmer’s reading has been adopted by most of the recent translations, for examples, García Martínez, “Calendarios en Qumran”; Wise, Abegg Jr., and Cook, *A New Translation*; García Martínez and Tigchelaar, *Study Edition*.

priestly course + yearly order + sign. In the previous two methods of separating the sentences, the word “sign” is taken as in construct form and is read together with the priestly name forming a conjugated pair, like “sign of Gamul”. This new proposal is to read the word as an independent noun in its absolute form.²⁴ With this new reading the above example entries would be like: “Shecaniah in the second year, a sign. Gamul in the fifth (year), a sign. Shecaniah after the release, a sign. Gamul in the fourth (year), a sign. Shecaniah in the release, a sign. ...” This revised reading has the same structure of the enumeration in the cycles as Glessmer’s proposal, but it also has the advantage of the following points:

1. There is no need to assume or supplement the word “sign” at the beginning of each jubilee cycle. In his revised reading of the passage cited by Milik, Glessmer wondered whether there should be a “sign” in front of Shecaniah, thus he wrote “(sign?) Schechanja in second year ...”.²⁵ The extant text does not allow him to put the word there or at the beginning of the other jubilee cycles, hence he concludes that the first entry of the jubilee cycles is slightly different in form from the rest of the entries. It has an extra word *בשנה* but does not have *אות*. In his other article on the *Otot*-text, Glessmer adds the word “sign” at the beginning of all the jubilee cycles.²⁶ Most of the other translations do the same, and some even do not indicate that the word is a supplemented one. This intrusion into the text made by the translators is unnecessary if they see that the word is not, in fact, missing but rather situated at the end of the sentence. That the word “sign” is not at the beginning of the entries is attested by the first entry of four jubilee cycles in lines 1 iv 11 (the second jubilee), 1 iv 18 (the third jubilee), 1 v 6 (the fourth jubilee), and 1 v 13 (the fifth jubilee).
2. It removes the problem of the awkward phrase “sign of the end of the jubilee” (*אות סוף היובל*). That each jubilee cycle is concluded with this phrase is accepted

²⁴ For the arguments to read this word independent of the priestly names see pages 265-266.

²⁵ Glessmer, “Investigation”, 435.

²⁶ Glessmer, “The *Otot*-Texts”.

in all the studies. However, unless one regards the word “sign” as an eponym without any special meaning or takes the “jubilee” in this text as standing for periods other than just 49 years, the phrase is problematic.²⁷ The word “sign”, if it denotes a special event, does not happen every year but only in the years of Gamul and Shecaniah, and these years do not always conclude the jubilees.²⁸ In two out of the three cases when the jubilees do not end with the year of Gamul or Shecaniah this phrase fails to materialise. By separating the word “sign” from the phrase “end of the jubilee” and regarding the word as attaching to the end of the preceding entry, this new reading resolves the problem because the phrase “end of the jubilee” can now indicate the conclusion of the jubilee in years which are not associated with Gamul or Shecaniah.

3. It matches with the purpose of the text. The number of signs in each jubilee is summarised after the enumeration, and it shows that the author of the text is actually interested in knowing how many signs there are in every jubilee. There might be other reasons for the author to write this text, but the purpose of having the signs counted is undisguised. The revised reading makes the counting of the sign more obvious. Each entry is a count of a sign, so the number of entries recited in each jubilee is the number of signs in that jubilee.

This new reading does not affect the overall structure of the cycles much, but it does improve the understanding of the text, especially at the beginning and the end of the recitation of the entries in each jubilee.

Do the summary statements belong to the preceding or the succeeding jubilee?

In every jubilee cycle, all the “signs” in it are recited one after the other with respect to their order in the seven-year release cycle. The author is especially interested in two elements related to these signs, firstly the total number of signs in that jubilee, and

²⁷ For the difficulties in reading the text as such see pages 303-305.

²⁸ For the calendrical event that the “sign” stands for see pages 264-267.

secondly the signs which fall on the release, and he gives summary statement that takes account of these two elements

Most scholars see the summary statements as a conclusion of the counting of signs in the preceding jubilee cycle. However, Glessmer raises a question about whether the summary statement belongs to the preceding cycle or the succeeding one.²⁹ He suggests that the summary statement may act as an introductory briefing to the following jubilee. Instead of understanding the summary statement as one single unit attaching to the preceding cycle, Glessmer separates it into two sections. He regards the first half, “the sign of the end of the jubilee”, as the concluding sentence of the preceding cycle, and the second half, the numbers of signs for the jubilee, as the introduction to the next cycle.

Perhaps the reason that makes Glessmer propose such a reading is the numbering of the jubilees. The only number for the order of the jubilees that can be confidently read in the extant text is the number “seventh” in the section following the last jubilee cycle. Since there are only six cycles in the whole text, this number is difficult to explain. However, by separating the summary statements and attributing the second half to the next cycle, the reading proposed by Glessmer resolves this problem. According to his reading the preserved number “seventh” does not refer to the sixth cycle of the text but to the one coming after. This “seventh” jubilee is exactly identical to the first jubilee, so no detail of it is repeated except the stating of its summary statement.

This reading of the summary statement may be able to solve the problem of the numbering of the jubilees, but it is not supported by the evidence of the text.³⁰ First, the argument that the summary at the end of the text belongs to an unstated cycle is not a convincing one. If the cycle is not required to be recited because of its

²⁹ Glessmer, “The Otot-texts”, 150-151.

³⁰ Even Glessmer himself has reservations in giving a final decision on the issue as he admitted: “What might have perplexed J.T. Milik and what I still cannot solve completely is: where exactly is the element to be placed, which in the following synopsis is marked with a headline ‘jub. IV (b)’? ... Are they preceding or following a jubilee? Every decision will leave some problems.” (“The Otot-texts”, 148)

similarity with the first cycle, then why is its summary stated? As the cycles are the same, their summaries of the counting of the signs should also be the same. According to Glessmer's reading there should be a summary for the first cycle at the beginning of the text, so it would be superfluous to have another identical summary repeated at the end of the text. Second, there is no such introductory summary preceding the first cycle. Although the lines in front of the first cycle are rather badly preserved, several words can still be clearly identified and none of these words match with the summary statement. Judging from the other cases, this statement should occupy about the length of a whole line. While two words in each line in front of the first cycle are preserved and they do not match with those of the summary statement, the chance of the statement being situated here is slight. Therefore the question posed by Glessmer, "Are they [the summaries] preceding or following a jubilee?" can be answered. They can only be following the jubilee cycle and concluding what is counted in front.

How does the text number the six jubilees?

After concluding that the summary statement can only be following the jubilee, now the problem of numbering the jubilees must be addressed. A standard summary statement takes the form of: "end of *a certain* jubilee. The signs of the *certain* jubilees: 16/17 signs, from which 2/3 signs on the release." The order number of the jubilee appears twice in each of these statements. For the former case, only the "third" (1 v 5) and the "seventh" (1 vi 16) are preserved but both of them are badly damaged and cannot provide a definite reading. In the latter case, also two numbers have been preserved, the "fourth" (1 v 12) and the "seventh" (1 vi 17), and while the "fourth" is an uncertain reading, the "seventh" can be read with certainty.

The jubilee cycles follow one after the other, so even if only one of their order number is found, there should not be any problem in reconstructing the order numbers for the others. However, the case is complicated here by the fact that there are only six cycles in the text but the only number found with certainty is the "seventh". If one assigns the order numbers according to this finding, the only possible way is for the

text to begin with the second and end with the seventh jubilee. Taking this approach Eisenman and Wise have tried to provide a reason for this peculiar arrangement.

Instead, it counts only Jubilees 2-7. Presumably the explanation for this peculiarity lies in the septimal concept inherent in sabbatical years and 49-year jubilees. The author wanted to emphasize the number seven. Since the priestly rotation in fact required only six years to repeat, the only way to end on the number seven was to begin counting with two.³¹

Their speculation is not groundless since the number seven has always been regarded as sacred in Jewish traditions. However, their explanation cannot be confirmed either for there is no such peculiar way of counting attested in any other Qumran texts. Furthermore, this view also has a practical problem. It is hard to imagine how the *Otot*-cycle could be used continuously without involving the first jubilee. Does it mean that every time at the completion of the seventh jubilee the cycle will start again with the second jubilee instead of the first?

Other scholars have tried to resolve this problem with different approaches. One is suggested by Glessmer who assigns the only surviving order number to the succeeding jubilee instead of the preceding one. However, that has already been shown to be unsuccessful. Another approach is attempted by García Martínez,³² who insists on the order of the jubilees to be counted from first to sixth. Based on the ambiguities of the order numbers in the first five cycles, he sees that these numbers are not necessary to be taken as those in the *PE*.³³ According to his own reading, he suggests that these numbers fit well with the scheme of counting the cycles from the first to the sixth.

In García Martínez's translation, the order number of the jubilee appears either once or twice in the summary statement. For the first five cycles, if the number is

³¹ Eisenman and Wise, *The Dead Sea Scrolls Uncovered*, 130.

³² In his previous translation García Martínez (*The Dead Sea Scrolls Translated*) agrees with the *Preliminary Edition* in this aspect.

³³ García Martínez, "Calendarios en Qumran", 346, n. 33 & 34.

recorded twice, they are identical to one another. However, in the last cycle, García Martínez provides a special reading: “el signo del final del jubileo [sexto] [Los signos del jubileo] séptimo son 16. De éste, en la Remisión [(caen) 2 signos ...”³⁴ In the footnote he admits that “La lectura שביעי[ה] en PAM 43.284 me parece absolutamente cierta”.³⁵ García Martínez has not explained why he translates this line differently from the other cycles. The only possible answer, although it is not explicitly stated, is that he thinks that the scribe had made a mistake here.

Nevertheless, García Martínez’s approach of numbering the jubilees has no textual support other than the simple logic that the cycles have to start with the first jubilee. His readings for the uncertain order numbers of the jubilees are possible but not definite. Even if he achieves getting his readings accepted as possible alternatives, he still has no concrete evidence to support his proposal. When considering the well preserved word “seventh”, it is very unlikely, although not entirely impossible, that all the correct numbers are lost but by coincidence the only mistake is preserved. Therefore, García Martínez is unfair in turning to a scribal error to resolve the problem.

After reviewing the other suggested solutions which have all been shown to be unsuccessful, we have to accept the peculiarity of the text in this respect and perhaps to consider also Eisenman and Wise’s explanation. Although their understanding is not problem free, it is the one which is better grounded on the preserved text and the ancient traditions.

Where does a jubilee end?

Another problem regarding the structure of the *Otot*-cycle is to decide where a jubilee ends. Most translations have taken the words סוף היובל אֹת at the end of each jubilee as one single phrase: “the sign of the end of the jubilee”. For the meaning of the word “sign”, Glessmer suggests two possibilities:

³⁴ García Martínez, “Calendarios en Qumran”, 348.

³⁵ García Martínez, “Calendarios en Qumran”, 348, n. 36.

1. ... the “sign” probably indicates the coincidence of a concrete moon-event and the beginning of every fourth year.
2. Indepent [sic] of a moon-context the list of every fourth year makes sense in context with the tithing ... In this case “sign” is used as an eponym.³⁶

With either of these meanings, the “sign” is associated with a particular event which happens every three years. In that case, the above phrase would be problematic with most of the translations.

“The sign of the end of the jubilee” would mean that the jubilee has to be concluded by a “sign”. However, since the number of years in a jubilee is not an exact multiple of three, a co-ordination of the jubilee cycles with a three-year span event would result in the end of the jubilees not always matching with the event. Amongst all the interpreters adopting this translation, only Eisenman and Wise have tried to tackle this problem. They take the “sign” as “a year in which the sun and moon were once again perfectly aligned at the year’s beginning”,³⁷ which according to their interpretation of the Qumran calendar would only happen once every three years. Eisenman and Wise indeed count the phrase “the sign of the end of the jubilee” as one of these “signs”. However, in order to resolve the problem, they have assigned two different senses to the word “jubilee”. One is its normal sense as a period of forty-nine years and the other refers to a period of variable length, which is roughly equated to forty-nine years but aligned with the cycle of “signs”. They call the variable length period the “jubilee of the *otot*”. According to their interpretation these two senses of counting the jubilee are conducted side by side with one another during the recitation of the cycles. The lengths of the “jubilees of the *otot*” as identified by Eisenman and Wise are:³⁸

³⁶ Glessmer, “The Otot-texts”, 155.

³⁷ Eisenman and Wise, *The Dead Sea Scroll Uncovered*, 128.

³⁸ Eisenman and Wise, *The Dead Sea Scroll Uncovered*, 129, table 2.

Jubilee of the <i>otot</i>	Length in Years	Ends in Year	End of Forty-Nine Year Jubilee
Second	49	49	49
Third	51	100	98
Fourth	51	151	147
Fifth	48	199	196
Sixth	48	247	245
Seventh	47	294	294

However, can this method of handling the text be justified? There are several problems with Eisenman and Wise's interpretation of the text. First, their variable length "jubilee" is questionable. There is no supporting evidence that the word when taken in a time reckoning context has ever been understood as a period of variable length. In Lev 25:8-10, concerning the statutes of the jubilee, it states that "you shall count seven weeks of years, seven times seven years, so that the time of the seven weeks of years shall be to you forty-nine years. ... it shall be a jubilee for you". The repetitive emphasis on the number of years makes it clear to its readers that the period of the jubilee is no other but exactly forty-nine years. Second, their decision on the meaning of the word in the text is arbitrary. They claim that "the term refers first to that period (only approximating to 49 years) that aligns with the cycle of *otot*. ... At other times the term denotes the actual period of 49 years."³⁹ However, they have not indicated in their translation which is which and have not provided the reasons for their decision on the sense of the word in each case. Third, even if one accepts their concept of the "jubilees of *otot*" for the sake of the argument, their calculation of the lengths of the jubilees is incorrect. Judging from the table, how they count the length of a "jubilee of the *otot*" cycle is from the year after the concluding sign of the previous cycle up to and including the year of the concluding sign of this cycle. In making their calculation they fail to realise that the third and the fourth jubilees are actually overlapping each other, and by mistake they include this repetition in their counting. As a result they make both the third and fourth jubilees fifty-one years. However, this mistake is cancelled out by another error which makes them able to align the two different cycles of the jubilee by the end of 294 years; they miscalculate

³⁹ Eisenman and Wise, *The Dead Sea Scroll Uncovered*, 129.

the second *otot*-jubilee. Instead of starting to count with the year immediately after the sign year, as in the other cycles, they have included the first sign year in this cycle.

With these problems, Eisenman and Wise’s proposal of two different senses for the term “jubilee” is unacceptable. Consequently the problem of “the sign of the end of the jubilee” also cannot be resolved by assuming that all the jubilees conclude with the sign year. The answer for this problem, as suggested before, lies with an alternative reading of the phrase, that is to separate the word “sign” from the rest of the phrase. The jubilees do not necessarily end with a sign. After the enumeration of all the signs in a jubilee, the phrase “end of the jubilee” is put in after the last sign to indicate the conclusion of the forty-nine-year period which may or may not be a sign year.

How many signs are there in each jubilee?

The last problem which needs to be addressed about the structure of the *Otot*-text is the number of signs in each jubilee. In the concluding summaries two elements about the signs of the jubilees are recounted. One is the total number of signs and the other is the number of signs that fall on the release. According to the *PE* these numbers in the summaries are:⁴⁰

Jubilee	Total no. of signs	No. of signs on the release
Second	17	[2]
Third	[16]	2
Fourth	17	2
Fifth	[16]	[3]
Sixth	[16]	[2]
Seventh	16	[2]
[] missing number reconstructed		

⁴⁰ The numbers are extracted from the transcriptions in Wacholder and Abegg, *The Preliminary Edition*, 96-98.

The original editors of the text have not indicated why the missing numbers are reconstructed as such. However, if one counts the number of signs of each cycle according to their reconstructed text in the *PE*, the result should be like:

Jubilee	Total no. of signs	No. of signs on the release
Second	17	3
Third	17	2
Fourth	17	2
Fifth	16	3
Sixth	16	2
Seventh	16	2

Moreover if one calculates the number of signs for the jubilees according to a schematic enumeration of a three-year period against the seven-year release cycle in forty-nine years for six jubilees, the result would be like:

Jubilee	Total no. of signs	No. of signs on the release
Second	17	3
Third	16	2
Fourth	16	2
Fifth	17	3
Sixth	16	2
Seventh	16	2

Comparing the data in the first table to the other two, it is difficult to see any rationale behind the numbers reconstructed in the *PE*. Since no explanation is given in this respect, these data do not warrant further discussion. When the data of the other two tables are compared, the result is more interesting. The two are almost identical with the exception of the total numbers of signs for the third, the fourth, and the fifth jubilee. It makes one wonder why the *Otot*-text deviates from the schematic enumeration. When these three cycles are carefully examined, it is not difficult to find out how the deviations come about.

According to the restoration in the *PE*, a sign of Shecaniah appears twice in both the end of the third jubilee and the beginning of the fourth jubilee. Before this is assigned as a scribal error, one should look at the reconstructed text first to make sure

that it is reliable. There is not much problem with the first entry at the beginning of the fourth jubilee, but the reading of the last entry at the end of the third jubilee is not that certain. The entry is entered in the *PE* as: “[בש]שית [אות] שכני[ה בשנית אות סוף]” (S^c 1 VI 4). After the letters בש the rest of the line is missing except for some broken traces of which not a single letter can be identified. These traces could be part of the phrase “בששית אות סוף” or some other unknown words. With the uncertainty of the reading one should not refer the error to the author. Removing this uncertain sign of Shecaniah from the third jubilee the total number of signs in this jubilee is sixteen as in the schematic table.

In contrast, the remaining deviations in the fourth and the fifth jubilee are likely to be induced by a scribal mistake in miscounting a sign in these jubilees. The last entry “Shecaniah after the release, a sign” (1 v 11-12) of the fourth jubilee should be the first sign of the fifth jubilee. The evidence for this scribal error is that in all the other cycles where the end of the jubilee can be firmly determined by the extant text, the phrase “end of the jubilee” always appears exactly where the jubilees are supposed to end.⁴¹ Unless one assumes that the author had different notions for the meaning of “jubilee”, one has to accept that the author did make an error here. Presumably the author did not have a complete schematic table of the jubilee cycles in front of him when he wrote the text. When constructing such a tedious and complicated text, it is conceivable that the author miscalculated his cycle by ending one of the jubilees one sign later than he should have. If the miscounted sign is put back from the fourth jubilee to the fifth, the total number of signs for the fourth and the fifth jubilee will be sixteen and seventeen respectively, which will then be the same as in the schematic table.

⁴¹ Other than the fifth jubilee, all the others can have their ends determined with certainty either by its own last sign or by the first sign of the next jubilee.

Summary

Although it cannot be said that the above discussions produce an absolutely clear picture about the *Otot*-text, they do help to resolve some of the problems in reading the text and to highlight the difficulties in some scholarly explanations. Before proceeding to discuss whether the text provides evidence for intercalation, it is useful to summarise the points so far been discussed about this text.

1. The *Otot*-text is an enumeration of an event named “sign”, which recurs every three years.
2. The enumeration of these signs is carried out against a framework of the seven-year release cycle.
3. The enumeration is separated into sections of jubilees, and there are altogether six jubilees in the whole text.
4. Each sign is enumerated by an entry with the standard formula: “Gamul/Shecaniah on the *certain* (year of the release cycle), a sign”.
5. After enumerating all the signs in one jubilee the total number of signs in that jubilees is recounted by a regular summary statement: “end of the *certain* jubilee. The signs of the *certain* jubilee: 16/17 signs, from which 2/3 signs on the release.”
6. For an unknown reason the six jubilees in the text are numbered from the second to the seventh.
7. The jubilee in this text is regarded as a period of forty-nine years.
8. Although there are deviations found in the extant texts, the total number of signs in each jubilee should be as follow:

Jubilee	Total no. of signs	No. of signs on the release
Second	17	3
Third	16	2
Fourth	16	2
Fifth	17	3
Sixth	16	2
Seventh	16	2

INTERCALARY SCHEMES BASED ON 4QOTOT

After looking at the *Otot*-text in detail we may now return to the question of whether Glessmer is justified in seeing hints of intercalation in this text. Two schemes of intercalary method have been proposed by Glessmer. The first proposal was constructed solely on the basis of Milik's 1976 partial publication.⁴² After the whole text was made public in the early 90's this proposal was proven to be a misreading and was subsequently retracted. However, while admitting the fault in his earlier proposal, Glessmer still maintained his view on the text about intercalation and set out a revised scheme, his second proposal, based on the full text.⁴³ Although Glessmer's first proposal is obsolete, it will still be listed and discussed in the following because it remains a scheme of intercalation based on the *Otot*-text and it will also help to reveal the nature of Glessmer's approach to the text.

Proposal 1

The first intercalary scheme proposed by Glessmer is a complicated one. To understand it a few remarks have to be made: (1) the proposal takes the basic unit of enumeration in the *Otot*-text to be a seven-year period; (2) the basic seven-year unit is counted in the jubilee cycle (49 years) by its order from one to seven and designated as "after the release", "the second", "the third", "the fourth", "the fifth", "the sixth", and "the release" respectively; (3) the occurrence of signs according to the seven-year units is enumerated for a period of a super jubilee cycle which contains seven jubilee cycles ($7 \times 49 \text{ years} = 343 \text{ years}$), and the total number of signs counted in each super jubilee cycle is summarised at the end of the counting of that cycle; (4) there are altogether six such super jubilee cycles in the whole text ($343 \times 6 = 2058 \text{ years}$).

⁴² Glessmer, "Der 364-Tage-Kalender".

⁴³ Glessmer, "Investigation".

Intercalary scheme:

There are two steps in this scheme to bring in the necessary adjustment.

Step 1 (regular insertion): to add a week in every seven years following the sabbatical year cycle (= 49 additional weeks in 343 years).

Step 2 (irregular insertion): to add twelve more weeks over the period of a super jubilee cycle (= 12 additional weeks in 343 years).

As a result the difference between the natural years and the intercalated 364-day years in 343 years time is reduced to:

natural year	$365.25 \text{ days} \times 343 = 125280.75 \text{ days}$	
- 364-day year	$364 \text{ days} \times 343 = 124852 \text{ days}$	= 428.75 days
- regular insertion	$7 \text{ days} \times 49 = 343 \text{ days}$	= 85.75 days
- irregular insertion	$7 \text{ days} \times 12 = 84 \text{ days}$	= 1.75 days

The two step insertions bring the 364-day year to a very close approximation with the natural year with only 1.75 days difference over a period of 343 years. This remaining difference can be smoothed out if a week is further added at the end of four 343-year periods. The role of the *Otot*-text in this scheme of intercalation is to assist the operation of the irregular insertions, and the method is to follow the text to add a week for each sign enumerated except for those which are related with the release, that is those designated as “after the release” or “on the release”. For the example cycle cited by Glessmer the total number of signs enumerated in that cycle is seventeen, in which three are “after the release” and two are “on the release”, so the remaining number of non-release related signs is exactly twelve.⁴⁴

⁴⁴ There does not always happen to be twelve of these signs in a 343-year cycle, but there happens to be twelve in the cycle cited by Milik, which was also the only information available to Glessmer when he constructed this proposal.

Proposal 2

The revised scheme proposed by Glessmer in 1996 is much simpler when compared to the first one. With this proposal Glessmer retracts the idea of seeing the basic enumeration unit of the text in a longer span of seven years, but returns to the original suggestion of Milik to view it as referring to a single year unit.

Intercalary scheme:

Similar to the previous one the intercalary procedure is also carried out in two steps.

Step 1 (regular insertion): to add a week in every six years based on the sexennial priestly roster (= 14 weeks in 84 years).

Step 2 (irregular insertion): to add a further additional week in every 84 years (= 1 week in 84 years).

As a result the difference between the natural years and the 364-day years in 84 years is reduced to:

natural year	$365.25 \text{ days} \times 84 = 30681 \text{ days}$	
- 364-day year	$364 \text{ days} \times 84 = 30576 \text{ days}$	= 105 days
- regular insertion	$7 \text{ days} \times 14 = 98 \text{ days}$	= 7 days
- irregular insertion	7 days	= 0 days

With both the regular and irregular insertions the shortage of the 364-day year is totally cancelled out. So how does the *Otot*-text help to carry out this intercalation scheme? No specific plan has been drawn up by Glessmer but he thinks that with such a text as 4QOtot it can easily provide the necessary means for the observation of both the regular and irregular insertions. As the sexennial priestly rotation forms part of the text's enumeration there should be no difficulty in following the priestly roster for the regular additional weeks. For the irregular insertions, since the "sign on the release" for a particular priestly course, either Gamul or Shecaniah, only occurs once every forty-two years, counting these signs would easily provide the necessary indication for

the irregularly inserted weeks, say for example in one of every two times when the “sign on the release” happens with Gamul.⁴⁵

4QOTOT - A TOOL FOR INTERCALATION?

Glessmer’s two intercalary proposals are attractive to those who have long been searching for a solution to this outstanding puzzle of the 364-day calendar. These proposals do not only provide the necessary means to smooth out the difference between the theoretical and the true solar cycles, but more importantly they are based on information extracted from a text that itself is firmly anchored on the 364-day calendar. Nonetheless one has to ask: does Glessmer rightly interpret the *Otot*-text in making up these proposals? There are shortcomings in his intercalary schemes which disclose that he is not.

1. Arbitrariness

The *Otot*-text contains cycles of various lengths including three-year, six-year, seven-year, forty-nine-year, two-hundred-and-ninety-four-year, and perhaps even some others. One should not make up intercalary schemes with these numbers and then claim the support of the text. Yet, this is basically what Glessmer is doing with his proposals. The arbitrariness of Glessmer’s handling of the numbers gathered from the text is best illustrated by the development of his proposals. Instead of looking for evidence of intercalation in the *Otot*-text Glessmer actually comes to the text with the assumption of its function as an intercalary tool. It is under this assumption that the two proposals are made.

The first attempt is to start with a “regular” seven-year insertion. This reduces the required adjustment to 1.75 days per seven years. In order to round up the remaining days this method needs one more extra week in twenty-eight years. Disappointingly, the numbers in the text cannot be arranged to make up this necessary

⁴⁵ Quoting the example suggested by Glessmer in “The *Otot*-Texts”, 156.

number of years. Therefore instead of making the “irregular” adjustment in twenty-eight years Glessmer resorts to rounding up the necessary days by adding roughly twelve weeks every 343 years. It was the search for these extra intercalary weeks that Glessmer needs to argue against Milik’s reading for a long-span interpretation of the text. However, to his regret this interpretation fails him. Realising the fault in his first proposal Glessmer reshapes his approach by making the “regular” insertion with the six-year cycle, which leaves only half a day in six years unaccounted for. With this new approach the alignment can be made by adding a week in fourteen of these six-year cycles. Therefore what is needed here is a period of eighty-four years. This time the task is easier to accomplish. The required number of years is readily arrived at with the multiple of the sexennial priestly cycle and the septennial sabbatical cycle ($2 \times 6 \times 7 = 84$).

This approach of finding the necessary information from the text cannot be regarded as textual proof for the case of intercalation. Unless they can account for not just some of the numbers but also the other elements of the text, these proposals are no more convincing than the speculations made by other scholars.

2. Overlooking of the introductory lines

Apart from their arbitrariness the major weakness of Glessmer’s proposals is that they fail to take into account the other elements of the text. With the exception of the material which is needed to make up his intercalary procedures Glessmer ignores the other elements of the extant text in constructing his proposals. These neglected elements together betray the flaws of Glessmer’s argument in understanding the text as an intercalary tool.

The first element which has been overlooked is the introductory lines (1 iv 10-11) at the very beginning of the *Otot*-text. In the development of his argument that the text is supposed to be interpreted in an intercalary sense, Glessmer tries hard to eliminate another possible rendering of the text, that is a lunar interpretation. Reading the text with a lunar connotation would definitely undermine Glessmer’s effort to see the text as an intercalary tool. Therefore he questions the text:

Is the distance of ‘signs’ every fourth year connected with special ‘lunar events,’ *i.e.*, ‘signs’ in an astronomical sense? Such events of special observance are to be supposed when the 364-day-calendar is thought of against a background of coordination with a lunar calendar. Such a coordination ... is attested in ... Mišm A and Mišm B. ... But is this true also for 4Q319? Or is it adequate to suppose a non-lunar re-interpretation, which uses the special counting of the ‘signs in the šemita’ in a sense of intercalation for a 364-day-year against the tropical year?⁴⁶

Certainly the *Otot*-text is not an enumeration of lunar events in the triennial period as in the cases of the Mishmarot A (4Q320) and Mishmarot B (4Q321 & 4Q321a),⁴⁷ but the astronomical sense of the *Otot*-text is undeniable. In the introductory lines the preserved wordings and their association with the creation on the fourth day of the creation week make the connection of these lines with the heavenly bodies indisputable.⁴⁸ Therefore any interpretation of the text must consider the relationship of these astronomically connected lines with the subsequent enumeration. In ignoring these lines Glessmer actually neglects an element which could undermine his whole argument of seeing the text in an intercalary sense.

3. Neglecting of the summary statement at the end of each jubilee cycle

⁴⁶ Glessmer, “Investigation”, 436. Similarly, this argument of rejecting the lunar interpretation to favour the intercalation rendering is presented in Glessmer, “The *Otot*-Texts”, 147, “This manuscript [4Q320] was already mentioned as a witness of the type of ‘calendarical documents’ which also have a coordination with moon-events. But it must be stated that no reference to the moon is discernible in the fragments [of 4QOtot] and that nothing like this is to be expected in the above arrangement of columns [of 4QOtot] ... If a moon-context seems not to be probable for 4QOtot, a model of intercalation seems to be the most plausible explanation for the hitherto unparalleled *Otot*-element in col. IV10-VI19.”

⁴⁷ In this sense Glessmer is quite right to see that 4QOtot is not parallel to any section of 4Q320. (Glessmer, “The *Otot*-Texts”, 147)

⁴⁸ cf. the discussion on the astronomical sense of these lines on pages 233-236.

The summary statements at the end of the jubilee cycles should not be neglected in any discussion about the function of the text. After counting the signs one by one meticulously throughout the 49-year period the text then carefully summarises the total number of signs and the number of signs on the release for that jubilee. This reflects that the author actually wants to know, or he wants his readers to know, how many signs there are in each jubilee and how many of these signs fall on the release years. Failing to consider these statements would inevitably miss the point of the text. Yet Glessmer's intercalary schemes have nothing to do with these summaries.

His first proposal is connected in some way with the number of signs in the jubilees. However, instead of accounting for the numbers in the summary statements (in the case of the sample cycle taken by Glessmer the numbers are seventeen and two), what Glessmer needs for his intercalary plan is twelve indicators of weekly insertion for the concerned period, so he chooses the signs which are not associated with the release (seventeen signs - two signs on the release - three signs after the release = twelve non-release related signs). This selection disconnects his proposal from the summaries, which only sum up the number of signs on the release but not those after the release. In this way Glessmer's first intercalary scheme cannot explain why the numbers are concluded at the end of each jubilee cycle.

The failure of Glessmer's second proposal on this point is even more obvious. In the article where he proposes his revised intercalary plan Glessmer does briefly discuss the summary statements, but what he does is simply question the position of these statements in relation to the jubilee cycles: "Are they preceding or following a jubilee?"⁴⁹ He makes no attempt to explain the function of these summaries in the text, and gives no role to the numbers in these statements in the intercalary scheme he proposed. What the proposed plan needs is an 84 years period which can be made up easily with the multiples of the sexennial priestly cycle with the sabbatical release cycle. How many signs the jubilee cycles contain and how many of these are on the release are of no concern to this intercalation plan. In order to make justifiable use of

⁴⁹ Glessmer, "The Otot-Texts", 148.

the text Glessmer cannot avoid the question on why the number of signs are summarised for the jubilees.

4. Inadequate accounting of the cycles enumerated

Glessmer's first proposal misses the mark by working from a misinterpretation of the text so there is no need to consider it at this point about the enumeration of the cycles. What we are concerned with here is Glessmer's handling of the enumerated cycles in his second proposal. The complete *Otot*-cycle is an enumeration of a repeated triennial period against the sabbatical release cycle over a period of six jubilees, a total of 294 years. With Glessmer's second proposal of intercalation one may wonder why the author of the text took the trouble of counting a three-year period for as long as 294 years. Only a sexennial cycle, not a triennial one, is needed to regulate both the regular and irregular intercalary procedures of this scheme. Also the irregular insertion is completed within a period of 84 years but not 294 years. A simple enumeration of the sexennial priestly cycle against twelve of the seven-year sabbatical cycles is sufficient enough to manage such an intercalary scheme, with which the 3-year, 49-year, and 294-year cycles all play no part. Yet these ignored cycles are all crucial components of the text. Therefore an interpretation ignoring these important parts can definitely not be justified as an acceptable understanding of the text.

The listed shortcomings of his proposals reveal that Glessmer has not taken the whole text into account but has merely gleaned the information necessary to draw up the intercalary plans for his assumed interpretation. In this respect Glessmer's proposals are not a proper interpretation of the *Otot*-text. Even though they are based on selected material of a 364-day calendrical text they are actually no different from the other speculative proposals. Nevertheless Glessmer may still be correct to say that: "If hints of intercalation are contained in Scrolls at all, 4QOtot needs to be

discussed as evidence”,⁵⁰ because the evidence of 4QOtot may in fact be a “clue” to the non-intercalated nature of the calendar of the scrolls.

4QOTOT - A TEXT AGAINST INTERCALATION

When the *Otot*-text is read together with the other calendrical texts it forms strong evidence for rejecting any form of intercalation for the 364-day calendar. The key for the text’s evidence against intercalation is with its lunar correlation. Unless one, like Glessmer, totally denies 4QOtot’s lunar connection, it is obvious that the rigidity of the whole calendrical system embedded in this text from the minute time scale to the long-term span will lock the structure of the calendar and leave no space for any external manipulation.

Since the lunar correlation of the *Otot*-text has already been discussed in the previous chapter, there is no need to repeat the arguments but only to restate the conclusion of the discussion to make the point: it is impossible that the *Otot*-text can enumerate a three-year cycle which is totally independent of the triennial lunar cycle of 4Q320. The repeatedly enumerated three-year period under the priestly names Gamul and Shecaniah in 4QOtot can only make sense when it is viewed as the time required for the co-ordination between the lunar cycle and the 364-day year. With the triennial lunar cycle of 4Q320 in mind there is no room for any other adjustment to be made within the three years time other than the one extra day added at the end of the period to complete the co-ordination between the schematic lunar and solar cycles of the calendar. Once the lunar correlation of the *Otot*-text is confirmed the repeated enumeration of this lunar triennial period against the longer cycles immediately extends the rigidity of the period to a much longer span of time in which the insertion of intercalary units becomes impossible.

If it were not for the *Otot*-text, one could still be able to argue that intercalation could be carried out beyond the time span of the cycles stipulated in the

⁵⁰ Glessmer, “Calendars in the Qumran Scrolls”, 264.

other Qumran calendrical texts;⁵¹ however, the evidence in the *Otot*-text removes the possibility of any of this speculation. All the intercalary methods proposed so far, including those suggested by Glessmer, could only work if either (1) the three-year period of 4QOtot is not connected with the lunar cycle, or (2) the triennial period is not a continuously uninterrupted cycle. However, the evidence of 4Q319 leads to the rejection of both possibilities.⁵² Thus the absence of intercalation for the Qumran Calendrical Documents over a period of 294 years is confirmed by this text.

Furthermore, if the 364-day year is not intercalated in 294 years it is unlikely that it would ever be adjusted. The 1.25 days discrepancy in 294 years amounts to a little more than a whole year ($294 \times 1.25 = 367.5$ days). Over such a period a non-intercalated 364-day year would have moved around the natural year for a complete turn, and would have arrived at approximately the same alignment as where it started at the beginning of the period. If the calendar can bear with the separation from the natural cycle for a complete round why does it need to bring in any adjustment at the point when the alignment is already achieved by the gradual shifting? So, the non-intercalation evidence of 4QOtot is sufficient to confirm that the 364-day calendar in the Calendrical Documents is not intended to be adjusted for natural accord over any period of time.

To sum up the discussion on examining 4QOtot as evidence for intercalation we have to conclude that the text is indeed an indispensable clue for the question of intercalation with the 364-day calendar, but not as Glessmer intends it to be. First, the claim of finding a textual intercalary method in this text is unfounded. Glessmer's proposals are not true representations of what is found in the text but rather attempts to turn it into what he wants it to be. By ignoring most parts of the text Glessmer only picks out the inherent numbers necessary to draw up his compensation plans for the

⁵¹ The longest cycle in the other Qumran calendrical texts is the sexennial priestly cycle. There are several proposed intercalary methods which have their adjusting insertions done over periods longer than six years. For examples, the intercalation methods 1. 2. 3. 4. and 6. listed in Beckwith, "Modern Attempt", 379-381.

⁵² For the continuity of the triennial enumeration of 4QOtot see discussion on pages 267-268.

deficient days. Therefore, for scholars who seek evidence to support the case of intercalation Glessmer's work has not improved the strength of their arguments because it is only another speculation among others. Second, by reading the *Otot*-text alongside the other Calendrical Documents its enumerated cycles actually constitute evidence, although implicit, for rejecting the case of intercalation. The other lunar related calendrical texts form a closely knit three-year co-ordination between the lunar cycle and the 364-day year that resists any intrusion; the *Otot*-text extends this rigid structure to a time span beyond the reach of any of the proposed intercalary plans. Based on this evidence alone we cannot conclude that intercalation never happened with the 364-day calendar, but at least we can confidently say that it did not happen with the calendar of the Qumran Calendrical Documents.

A possible interpretation of the *Otot*-text

If 4QOtot is not designed for the purpose of adjusting the 364-day calendar then what is it meant for? Without an explicit answer from the text itself it is difficult to reach any firm conclusion on this question. Yet attempts can still be made to understand the text by the material preserved in the fragments. In order for it to be a fair interpretation one has to consider every piece of recoverable information. Below are some major elements embedded in the text which any genuine interpretation must consider.

- The introductory lines, especially their astronomical connotation and their connection with other calendrical texts
- The summary statement at the end of each jubilee cycle, especially the numbers summarised for the signs
- The epithet "sign", its meaning, its association with the two priestly names, and the triennial period that it signifies
- The seven-year cycle and the year of release
- The 49-year jubilee cycle

In trying to establish a possible interpretation of the *Otot*-text, the question to start with is: what is the meaning of the epithet “sign”? When the same question is asked by Glessmer, he suggests two possible answers:

1. In a ‘moon-context’ ... ‘sign’ probably indicates the coincidence of a concrete moon-event and the beginning of every fourth year.
2. Independent [sic] of a moon-context the list of every fourth year makes sense in context with the tithing ... In this case ‘sign’ is used as an eponym.⁵³

Although he supposes that “in a certain phase of the Second Temple period there might have been no contrast between these two possibilities and perhaps they derive from a common background”,⁵⁴ basically he treats the two as independent and exclusive alternatives. Glessmer may well be right in noting that in the Mishnah the regulations on the three-year tithe have no connection with the lunar reckoning, but this lack of connection in the rabbinic literature does not necessarily imply that the same is true for the Qumran Scrolls. My proposal is that the “sign” in the *Otot*-text actually has dual connotations, that is an astronomical sense and an economic sense.

As repeatedly mentioned the astronomical sense of the text is indisputable, and the epithet “sign” probably represents the coincidence of the full moon with the beginning of the year. The introductory lines and the three-year enumerated period definitely point to such a connection. However, Glessmer is also right in seeing that an enumeration of such a lunar correlated period with the release-year cycle does not make much sense. What is the point of knowing which years in the sabbatical release cycle start with a full moon? So it is more likely that while the lunar correlation of the term is certain, it also at the same time has another connotation - an economic sense connecting with the three-year tithe of the Levites. The Levitical tithe is stipulated in Dtn 14:28-29

⁵³ Glessmer, “The *Otot*-Texts”, 155.

⁵⁴ Glessmer, “The *Otot*-Texts”, 155.

Every third year you shall bring out the full tithe of your produce for that year, and store it within your towns; the Levites, because they have no allotment or inheritance with you, as well as the resident aliens, the orphans, and the widows in your towns, may come and eat their fill so that the Lord Your God may bless you in all the work that you undertake.

Although the connection of the “sign” with this special tithing is not specified in the extant material of the manuscript as in the case of the astronomical connotation, the enumeration against the release-year cycle makes the connection plausible. As Glessmer puts it, “for the tithing in connection with שְׁמִיטָה -years there exist regulations to be observed. The special attention given to counting the signs may be explained in this way.”⁵⁵ If connecting the “sign” with the three-year tithe provides a better explanation for the purpose of its enumeration, then we have to ask: do we have to totally give up the lunar context of the text in order to opt for this interpretation, as Glessmer does? In fact, Glessmer also sees the text as having dual functions. He is willing to accept the counting of the signs in connection with the Levitical tithing together with a coexisting calendrical meaning of an intercalary scheme with the 364-day calendar. With the failure of the intercalation interpretation we should now seriously consider the possibility of a coexistence between the tithing context and the astronomical sense in the *Otot*-text; one is more specific but does not fit well with the context, and the other is not so clear but makes a better explanation of the text.

I see no conflict in perceiving both senses in the text. As has been widely attested, the people of the Qumran Scrolls were closely related with the priestly circle. There should be no surprise that an ordinance concerning the levy to the Levites would be given special attention by these people. They should be very familiar with this second tithing and its stipulated three years period. To the other Jews this triennial period may have no other special association except the biblical statute, but for the people of Qumran it is different. In their calendrical system there is a special

⁵⁵ Glessmer, “The *Otot*-Texts”, 155. The regulations concerning the three-year tithing and the release-year cited by Glessmer is in the Mishnah (*m. Ma'aser Seni* 5:6).

place for the three-year period - it embraces the perfect co-ordination between their sacred calendar and the lunar cycles. For people treasuring such an idealised calendrical system, it would be natural for them to associate the two important ideas into an unified concept. The perfect astronomical conjunction constitutes an ideal theological backup for the biblical tithing. The three-year time is not only a period stipulated in the Pentateuch for giving to the Levites but also has its place in the orders ordained by God for the heavenly bodies. Thus for these people the “sign” reached by the coincidence of the full moon with the beginning of the year in every three years would also signify the time of observing the Levitical tithe according to the Mosaic law.

After suggesting the dual meanings of the epithet “sign”, the next question to be asked in the quest for an interpretation of the *Otot*-text is: why are these signs counted? The counting is more likely to be connected with the economic sense rather than the astronomical sense of the three-year period. There are regulations in the biblical statutes regarding the enumerated cycles which makes the counting of a text such as 4QOtot meaningful. As cited above Dtn 14:28-29 commands that for every three years a tithe of all the produce of the year is to be saved up for the Levites and the poor. Following right after this ordinance are the regulations for the release of the seventh year. “Every seventh year you shall grant a remission of debt.” (Dtn 15:1) However, in the Pentateuch the seven-year cycle is not only regarded as the time for remission, but it is also a time for letting the land rest. In Lev 25 the law of the sabbatical rest is related:

1. The Lord spoke to Moses on Mount Sinai, saying: 2. Speak to the people of Israel and say to them: When you enter the land that I am giving you, the land shall observe a sabbath for the Lord. 3. For six years you shall sow your field, and for six years you shall prune your vineyard, and gather in their yield; 4. but in the seventh year there shall be a sabbath of complete rest for the land, a sabbath for the Lord: you shall not sow your field or prune your vineyard.

Every three years a tithe of the earth's produce is to be given to the Levites but every seven years the land is also to be provided with a time of rest. There do seem to be complications resulting from the operation of the two regulations alongside one another. For every twenty-one years the triennial tithing would fall on the seventh sabbatical year. If the land is not allowed to be sowed and the yield to be gathered in the sabbatical year, what do people give for the Levitical tithe in these years of coincidence? This must have caused concern for people trying to give strict observance to these biblical regulations. Similarly, if the three-year tithe constitutes an important part of the Levites' income, this clash of the regulations must have some effect on their life too. Under these considerations, to construct a text such as the 4QOt^{ot} makes perfect sense. Its primary purpose is not calendrical or astronomical but economic. In counting and summarising the signs in such a manner it achieves the following functions:

- (1) noting which years in the jubilees are for the Levitical tithe (the "sign" year),
- (2) marking the years when the tithe falls on a release year,
- (3) calculating how many Levitical tithes there are in each jubilee,
- (4) knowing how many of these tithes coincide with the release year.

If the Levites are going to get a reduced portion or nothing at all when their tithes fall on the release years, the *Otot*-text can give them a clear idea of when this will happen and how many tithes they will actually receive in each block of the 49-year jubilees. Such a reading on the *Otot*-text does not only explain why the three-year signs are enumerated against the seven-year release cycle but also takes care of why the enumerated signs are summarised at the end of each jubilee.

This proposal of interpreting the *Otot*-text in an economic sense and understanding the epithet "sign" as having a dual meaning may still be far from proven, but it has the advantage of taking the various elements of the extant text into consideration and attempting to give due weight to every piece of information that is found.

CONCLUSION

On the question of intercalation with the 364-day calendar, the evidence from the Calendrical Documents is negative. The text which has been put forward with great expectation for providing the concrete intercalary method turned out to be proof of a non-intercalated calendar instead. The rigid time frame over a long period of time embedded in the enumerated cycles of 4QOt^{ot} virtually bars any artificial manipulation of the fixed year length of 364 days. Although the evidence in this text does not rule out the possibility of the 364-day year calendar being intercalated in other circles, it confirms that this is not the case in the Qumran Calendrical Documents. Rather than being a tool of intercalation the *Otot*-text is more likely instead to be concerned with the practice of the biblical ordinances concerning the Levitical tithes and the sabbatical release years.

CHAPTER 6

CONCLUSION

The challenge of the calendar before Qumran scholars remains immense. Such a huge task can only be resolved with continuous effort and perseverance by placing small pieces together in order to complete the big puzzle. After many years of research there are still many unanswered questions about the Qumran calendar and all these questions have potential implications for the understanding of the nature of the Qumran Scrolls and the people to whom they belonged. In response to this difficult challenge every single work of research can only tackle part of the problems and hope to contribute its piece to the puzzle. This thesis aimed at providing its small but important piece of contribution - a comprehensive study of the calendrical reckoning system of the Qumran Calendrical Documents.

Regardless of whether it is for the discussion of the calendrical dispute in its historical context or in the search for the origin of this peculiar Jewish tradition, it is necessary to compare the calendrical system of the scrolls with other calendars of that time. How are the days reckoned in the Qumran Scrolls? This seemingly simple and basic question has mainly been ignored or simply assumed by many who are interested in the study of the Qumran calendar. However, a closer examination of the issue proved that the question is far from settled. Much of the discussion on the calendrical issue is based on assumptions that were made long before the concerned scrolls were even available for evaluation. However, even after the material was made available few people tried either to question these assumptions or to verify them with hard evidence. Thus the aim of this thesis was to find the answer to this simple question based on the evidence from the Qumran fragments. Three areas were set for the quest: (1) how the days are arranged into weeks, months, and years; (2) how the lunar cycle is reckoned; and (3) whether the years are intercalated to match with the true solar cycle.

In searching for data to construct the calendrical reckoning system the handicap of a lack of a reliable reading of the Qumran Calendrical Documents called

for a review of all the manuscripts concerned. The study of the texts of these manuscripts proved to be a rewarding one. Although transcriptions and translations of these documents are readily available nowadays for anyone who is interested in the topic to read, they are disappointing by either being outdated or just not comprehensive and detailed enough. By checking the best available reading of each manuscript with the corresponding photographs of its fragments the textual study in chapter 2 achieved the goal of providing a solid foundation for the subsequent chapters to build upon. By looking at the texts fragment by fragment, the study was able to distinguish what was actually read from the extant fragments and what was reconstructed by the editors, and also whether the reconstructed text was based on evidence from the extant fragments or on personal interpretation. This textual study established an essential tool for the rest of the study especially when data were extracted from these texts to formulate the reckoning system.

Following the confirmation of the reading of the texts, the question of how the days are regulated into weeks, months and years was looked at. There has long been a structure assumed for the 364-day calendar, but proposals for alternative structures still come up from time to time. Therefore it was necessary to ask: is the assumed structure really the one underlying the Qumran Calendrical Documents? By investigating three important aspects of calendrical arrangement, the research was able to conclude that there was only one way of arranging the days into months and years in these texts. Due to the presence of the special Priestly-Course feature it was relatively easy to affirm most of the Calendrical Documents with the proposed calendrical structure. For those without the Priestly-Course feature, some were still possible to provide firm evidence for their compliance, but some were not able to provide enough information to reach any firm answer. However, an important conclusion was still able to be made with all the manuscripts, that is that there is no evidence in these texts to support any other form of calendrical structure. With this the question of the diversity of the Qumran Calendrical Documents, as far as the regulation of days is concerned, can now be put to rest. There is only one form of calendar in these documents, one which reckons (1) a year with only 364 days, (2) the

beginning of the year always on the fourth day of the week, and (3) the months with a regular quarterly pattern of 30-30-31 days.

The second aspect of the calendrical reckoning system of the Qumran Calendrical Documents to be investigated was the lunar reckoning in these documents. Not every one of the documents has included the lunar cycle in its enumeration, but the number of texts involved does show that the lunar cycle plays an important part in the Qumran calendrical system. Altogether there were five manuscripts confirmed with a lunar connection. Based on the information extracted from these lunar correlated scrolls a complete system of lunar reckoning was assembled, from the minute day to day phase changes of the moon to the long-term operation of the cycle over hundreds of years. In the Calendrical Documents the lunar cycle is understood in a highly schematic pattern and it is subordinated to the fundamental regulator of the calendar - the 364-day year. The overall structure of the cycle can be represented by a single formula: $3 \times 364 \text{ days} = 18 \times 29 \text{ days} + 18 \times 30 \text{ days} + 29 \text{ days} + 1 \text{ day}$. During the search for the lunar reckoning of the Qumran Calendrical Documents an important point was discovered which changed the prevailing perception of the role of the lunar cycle in these documents, that is that there never existed a lunar calendar in these documents. All the lunar related texts in these documents agree on one point that the lunar cycle is only the object of their enumeration but not the calendrical base of their reckoning. By comparing the picture of the lunar cycle acquired with the lunar texts in the pseudepigraphal books, a reversal of the general understanding emerged. On the one hand, the supposed opposition of the Qumran scrolls against *Jubilees* is, in fact, unfounded. The way in which the lunar cycle is treated in the Qumran Calendrical Documents forms no contradiction to the calendrical polemic in *Jubilees*. On the other hand, the apparent affiliation with *1 Enoch* is unreliable. The differences in their lunar reckoning proved that these texts are actually based on two different systems.

The final aspect of the Qumran calendrical reckoning to be investigated was the important question of intercalation. The issue is important not only because it is concerned with the time reckoning system, that is the continuity of the perceived structure of the 364-day calendar, but also because of its possible impact on the

understanding of the historical context of the calendar. Scholars are divided over the issue of whether the calendar was intercalated. Both sides have tried to search for evidence to support their claim but neither side has prevailed because the arguments used are more or less indirect or unproven. This makes the intercalation proposals suggested by Glessmer based on a Qumran Calendrical Document, 4QOtot, crucial in the debate. However, an in-depth analysis of the base text and the intercalary methods of Glessmer's proposals proved that his claim of finding positive evidence in favour of intercalation with the 364-day calendar was invalid. On the contrary the enumerated cycles in the document were shown to be evidence against the intercalation of the calendar. Therefore the conclusion was reached that, at least for the Qumran Calendrical Documents, the structure confirmed in the previous chapters was not to be interrupted by any intercalation in order to bring it in alignment with the natural cycle. Instead an alternative proposal for the interpretation of the Otot-text demonstrated that the text was more likely to have a different concern from that of adjusting the calendar.

On the whole the detailed study of the Qumran Calendrical Documents and the analysis of their data on some key aspects of the calendar produced a picture of the time reckoning system of these documents. It is a picture of compaction and harmony - everything is neatly placed, and this ideal system is not changed and would not be changed, even over time. As there are other aspects of the Qumran Calendrical Documents which this study has not touched on, one cannot judge from the result of this study that there is no diversity or difference amongst these documents, but as far as the time reckoning system is concerned one can definitely say that they all agree on a single system which is not going to be advanced or delayed by even a single day.

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APPENDIX A

PHOTOGRAPHS OF FRAGMENTS OF THE QUMRAN CALENDRICAL DOCUMENTS

Col. ii

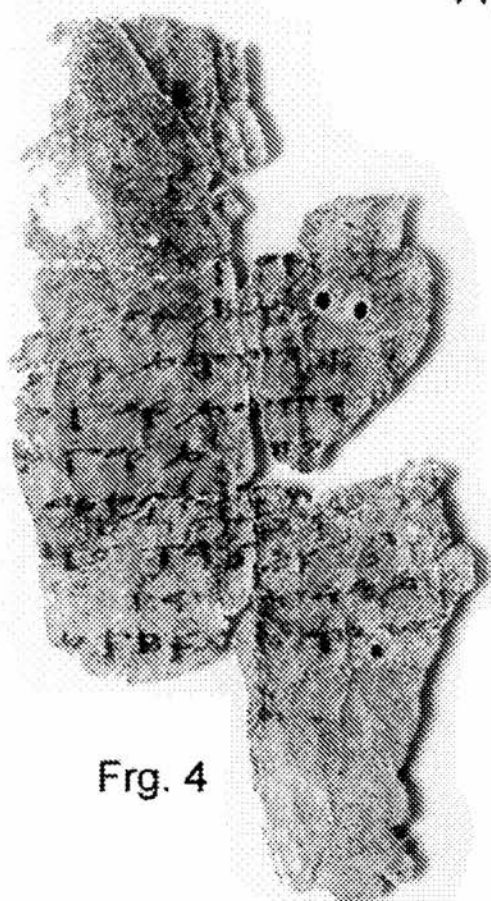


Col. i





Frg. 2

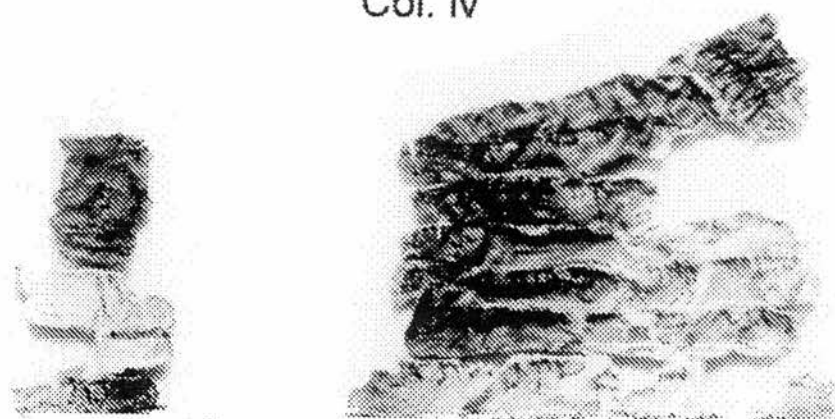


Frg. 4



Frg. 3

Col. iv

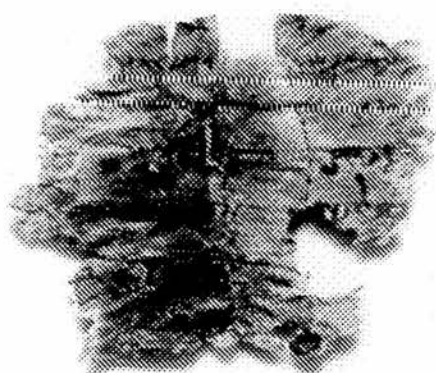


Col. v

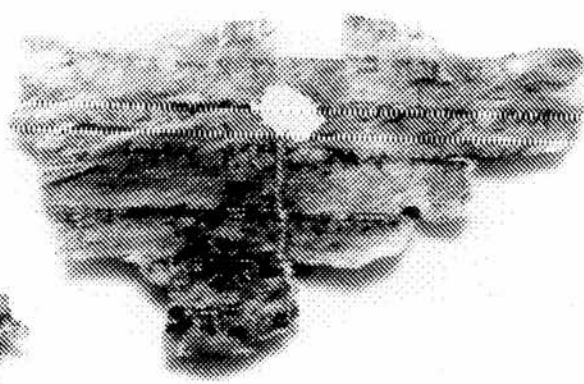
Col. vi



Col. vii



Col. vi



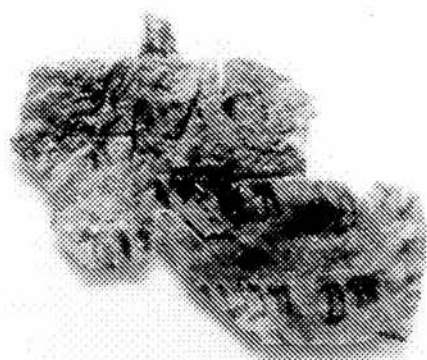


Fig. 7



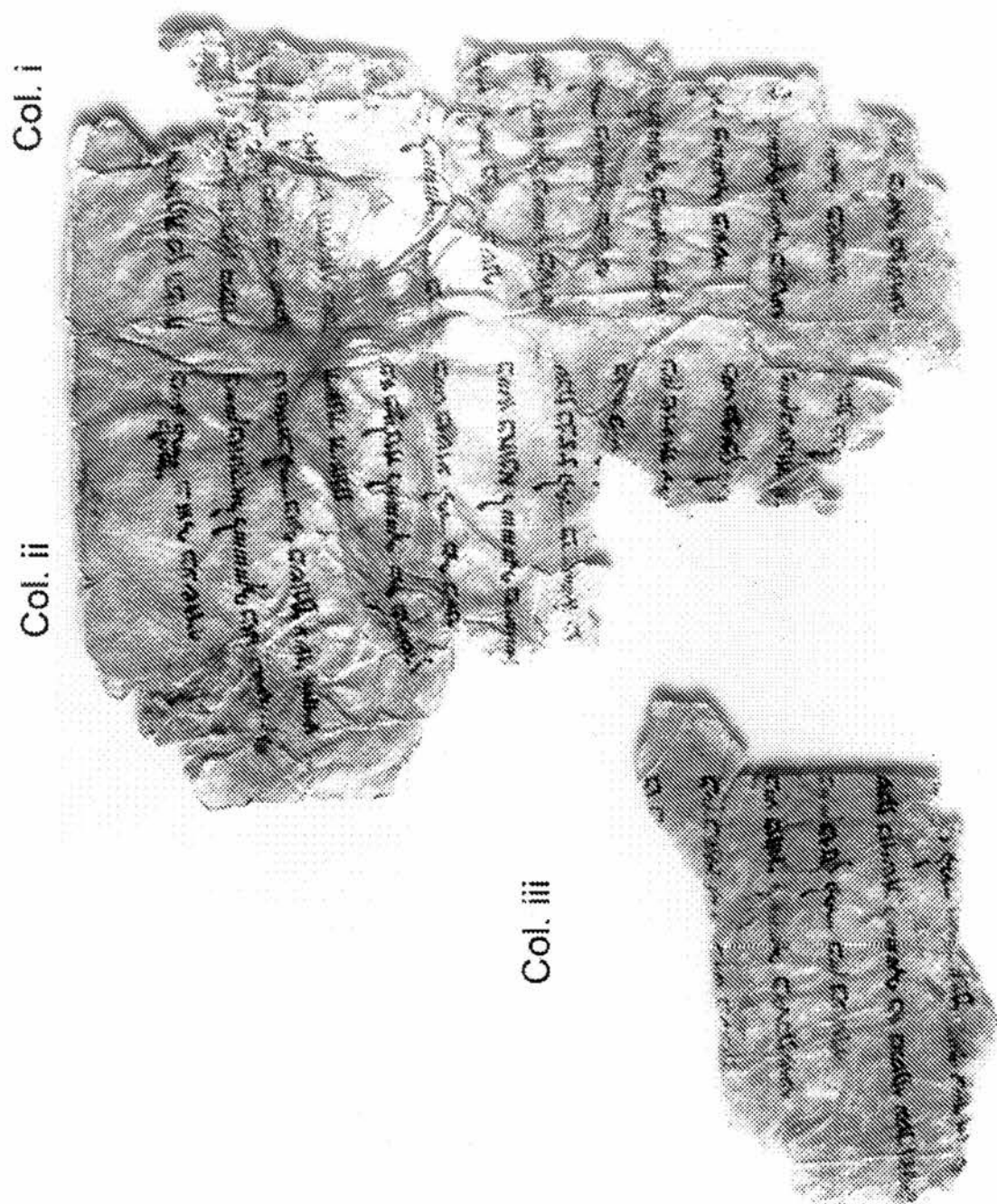
Fig. 2



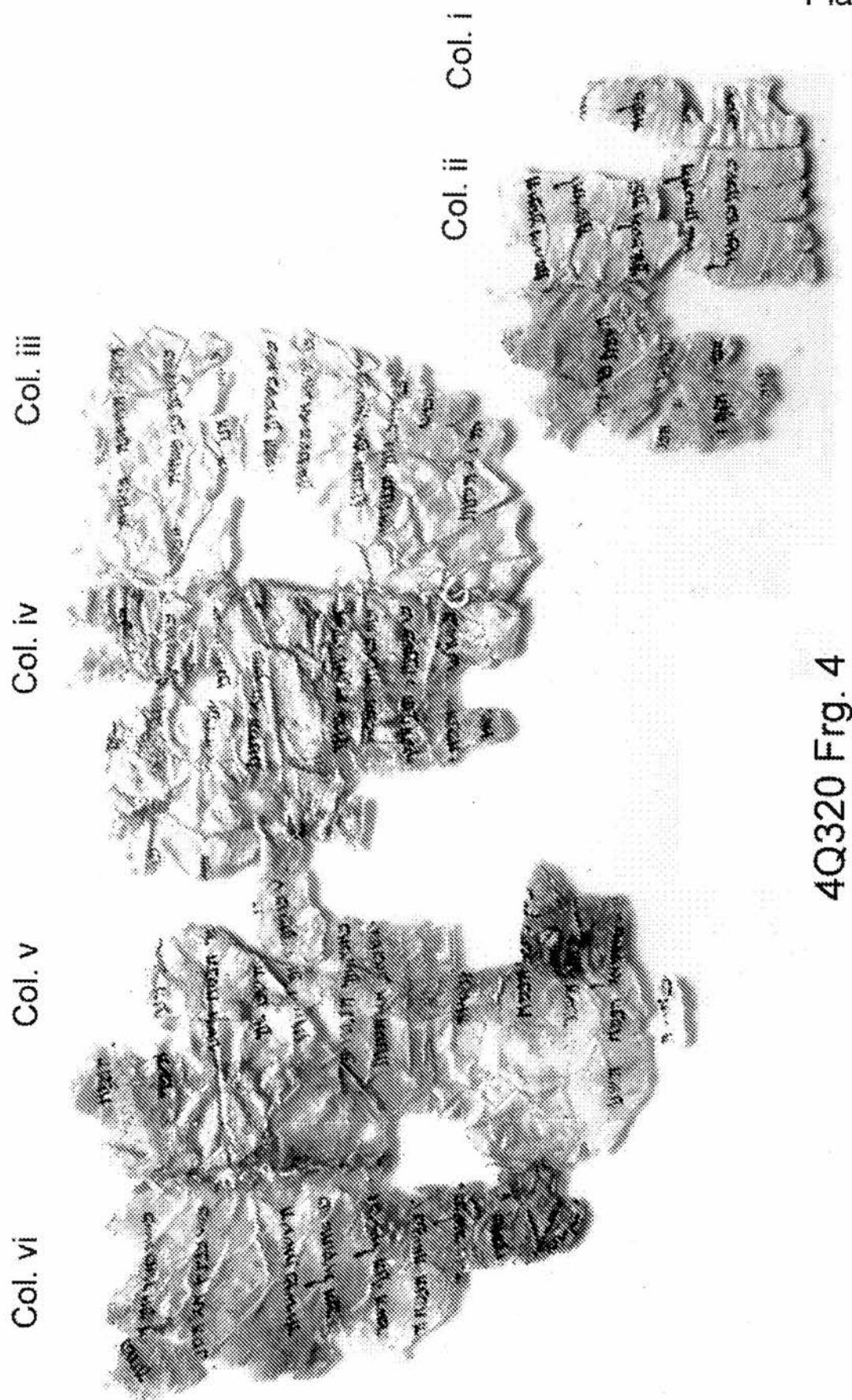
Fig. 9



Fig. 8



4Q320 Frg. 1





Frg. 3



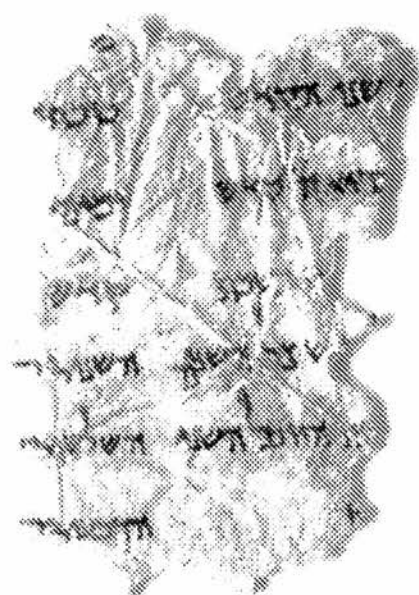
Frg. 5



Frg. 7



Frg. 9



Frg. 2

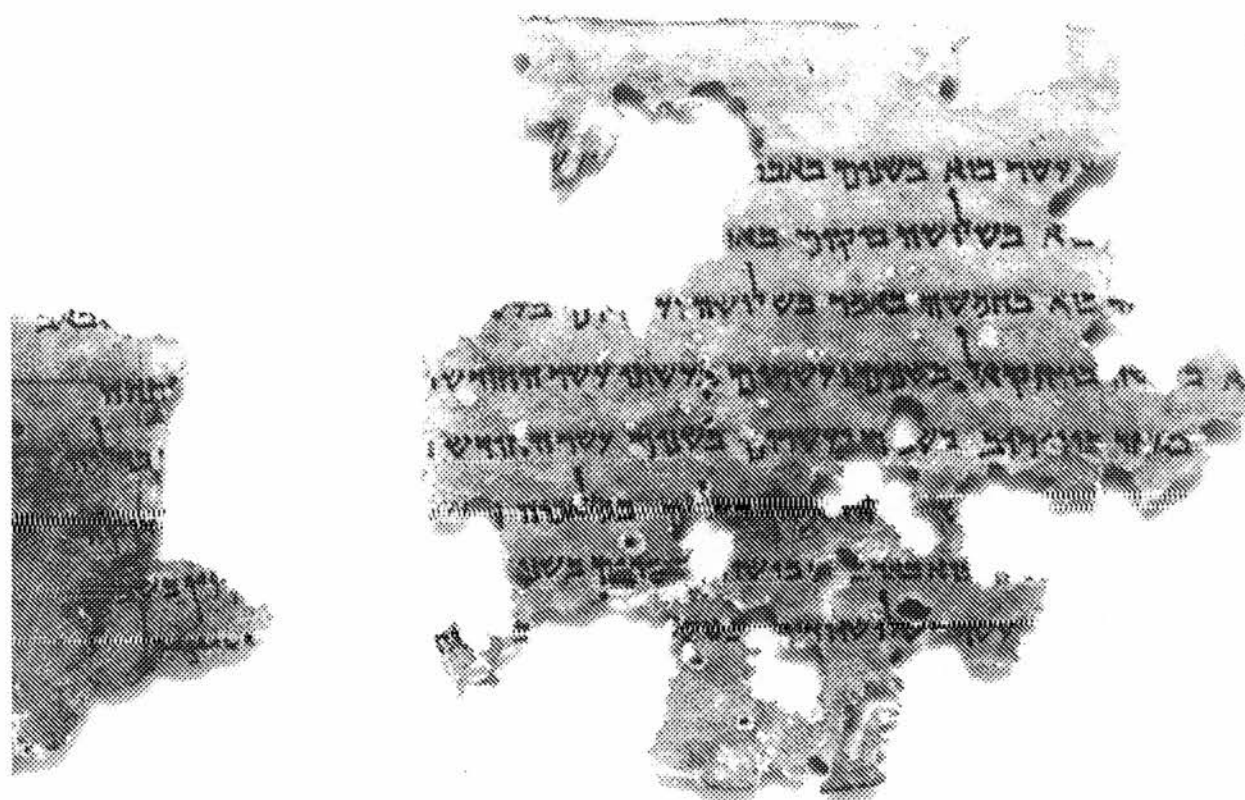


Frg. 6



Frg. 8

Col. i



Col. ii

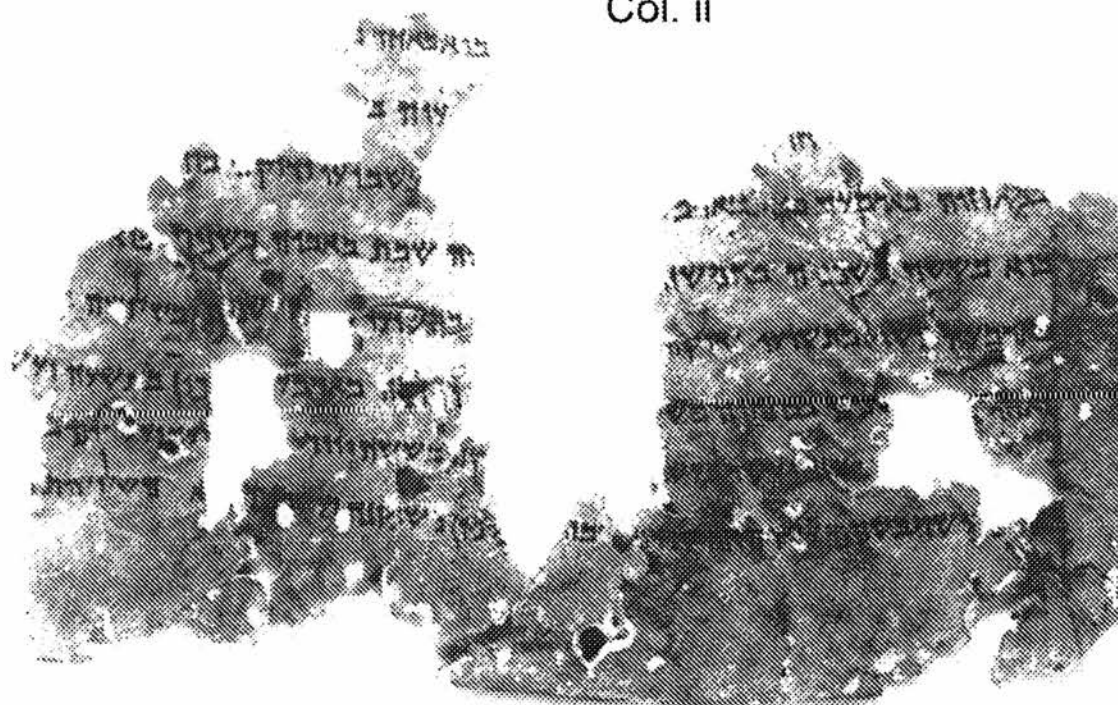


Fig. 1, Col iii

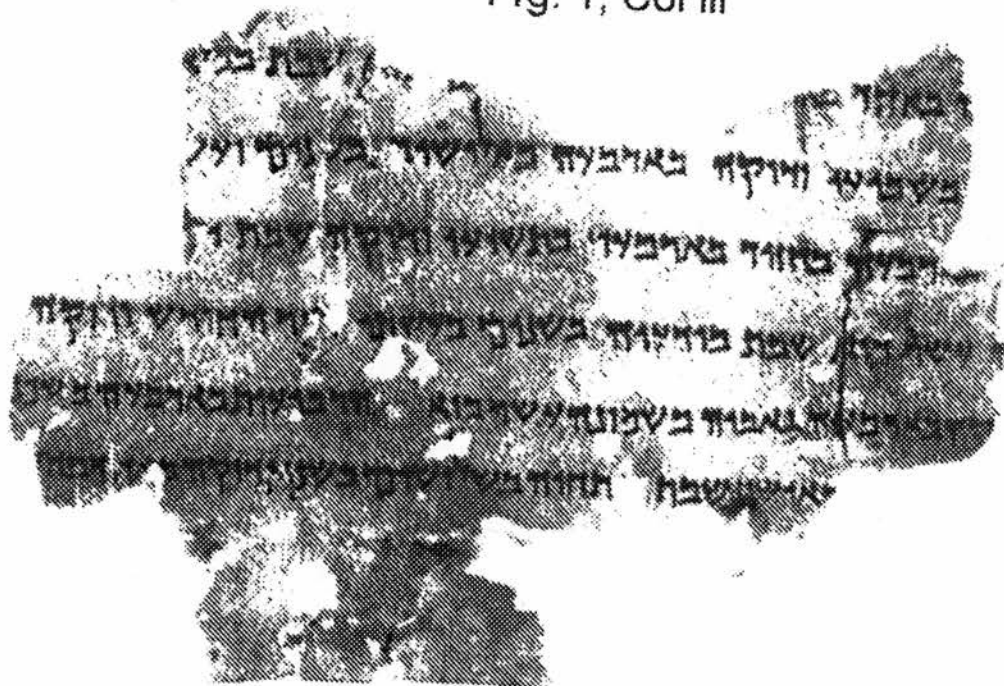
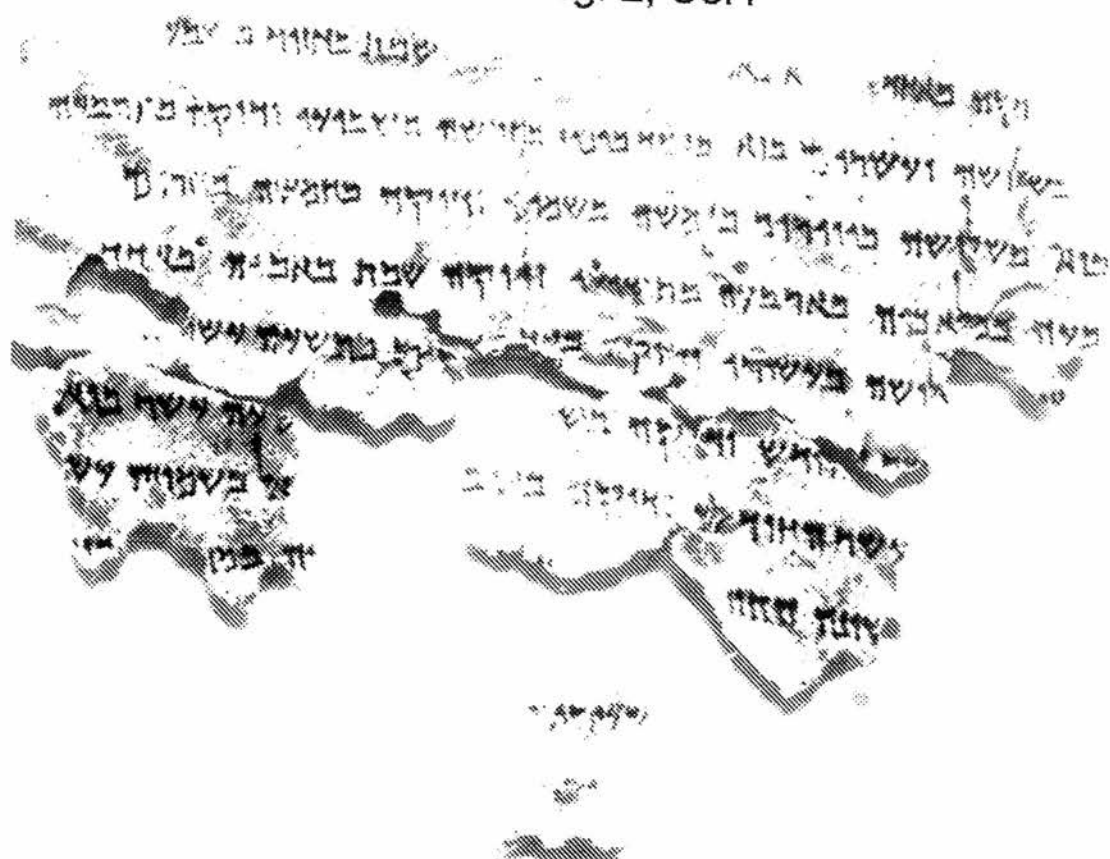
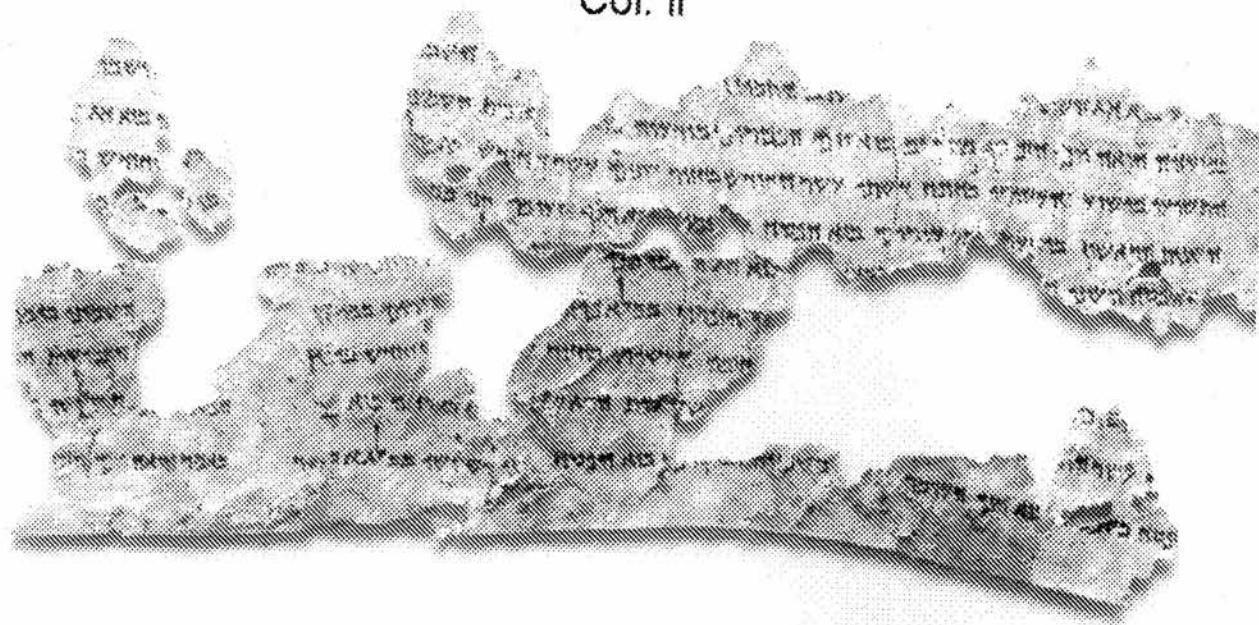


Fig. 2, Col i

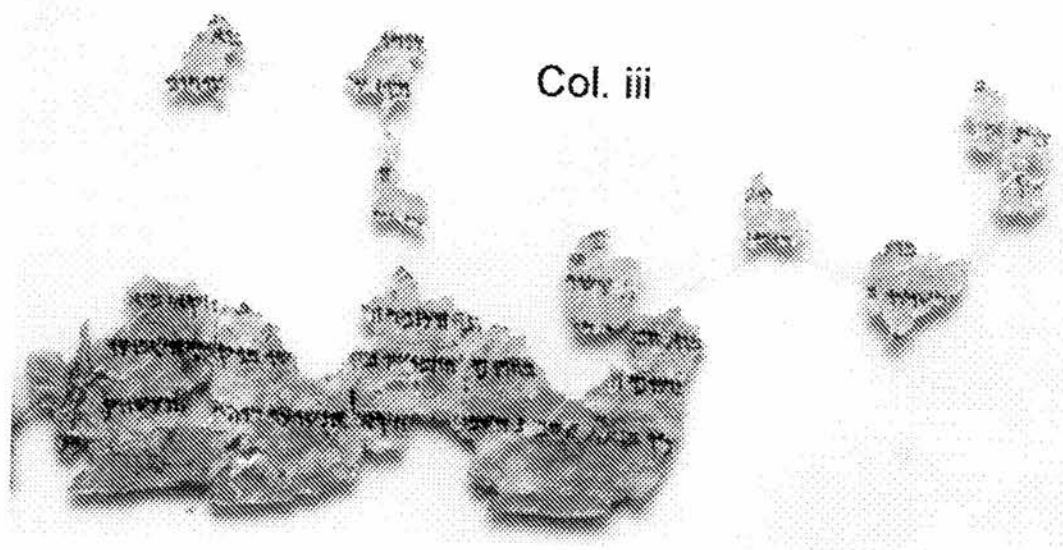


Col. ii

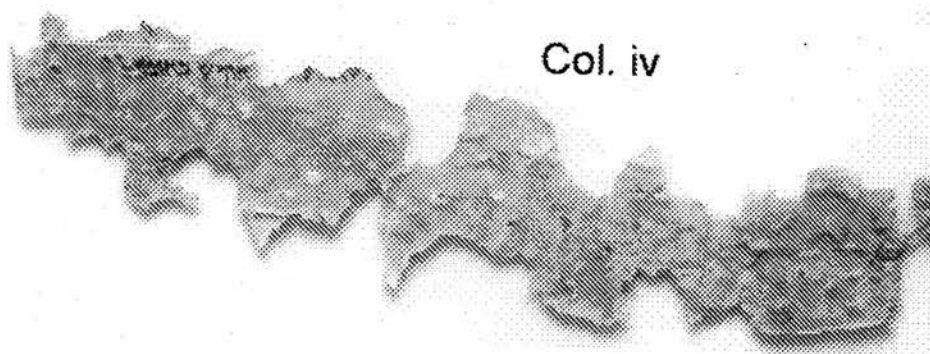
Plate XI



Col. iii



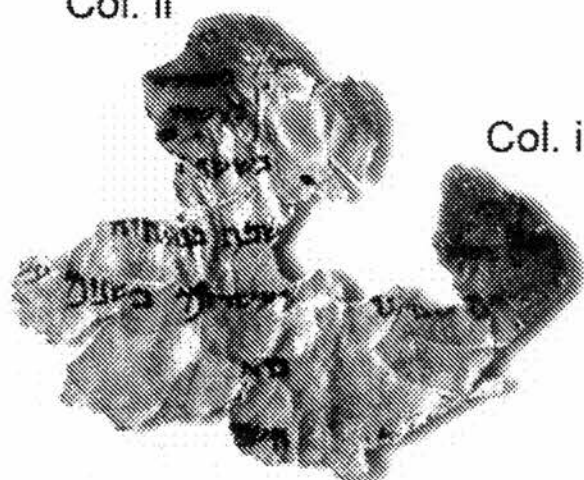
Col. iv



Col. ii

Plate XII

Col. i



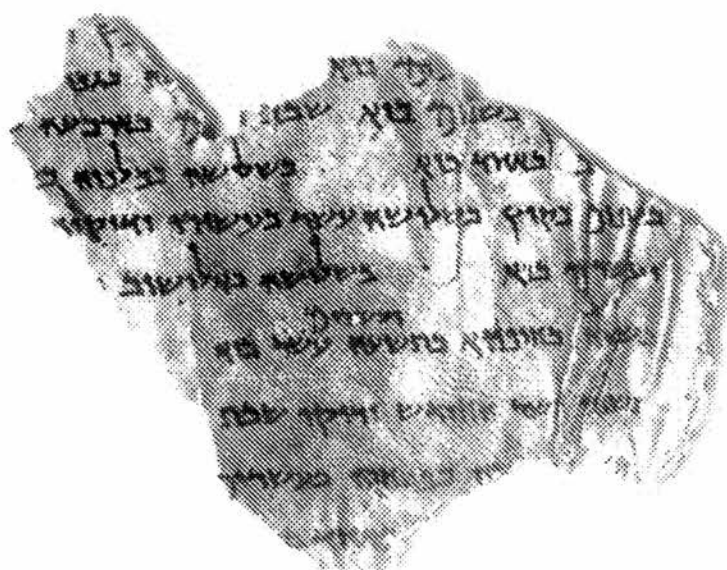
Frg. 1



Frg. 4



Frg. 2



Frg. 3



Frg. 5

4Q321a

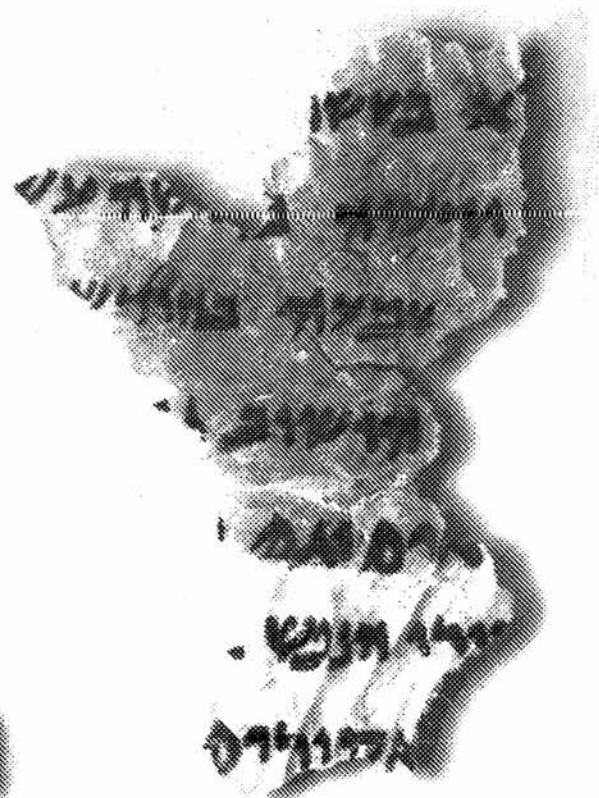


Fig. 1

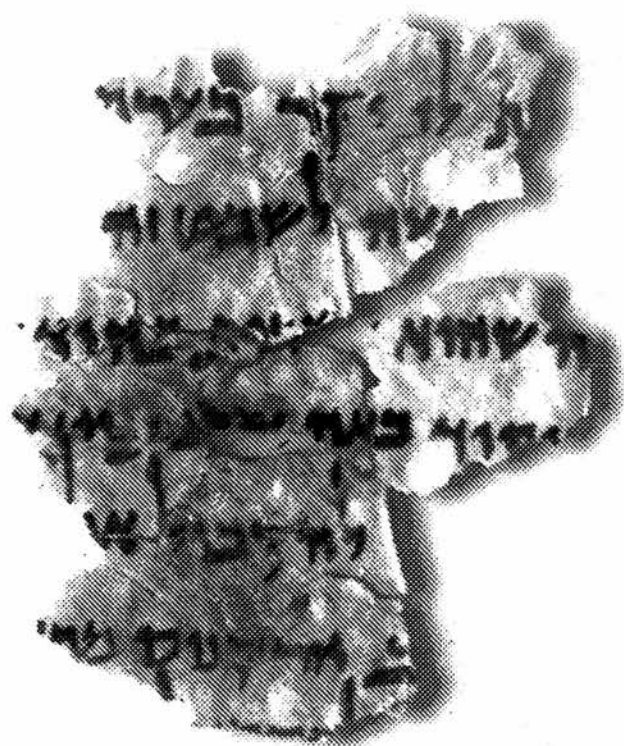


Fig. 2



Fig. 4

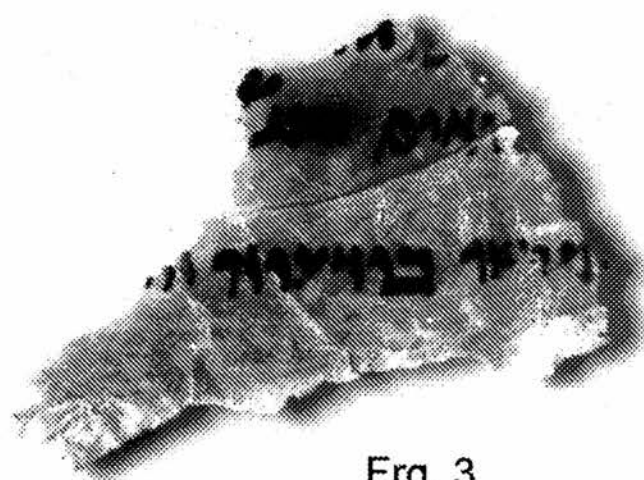


Fig. 3



Fig. 2

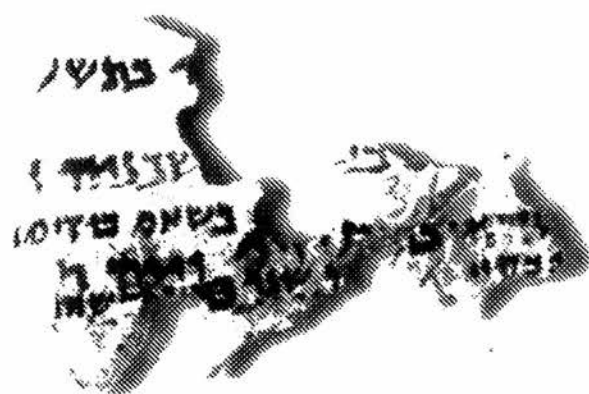


Fig. 1

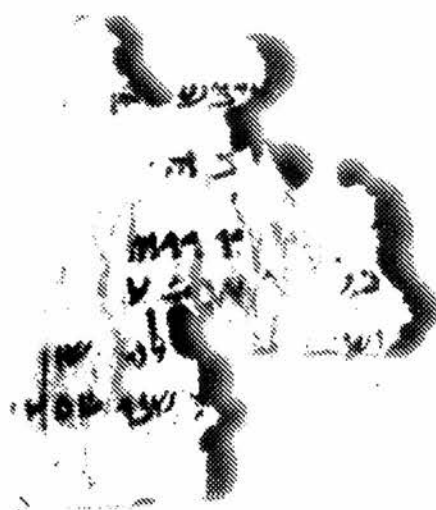


Fig. 4



Fig. 3

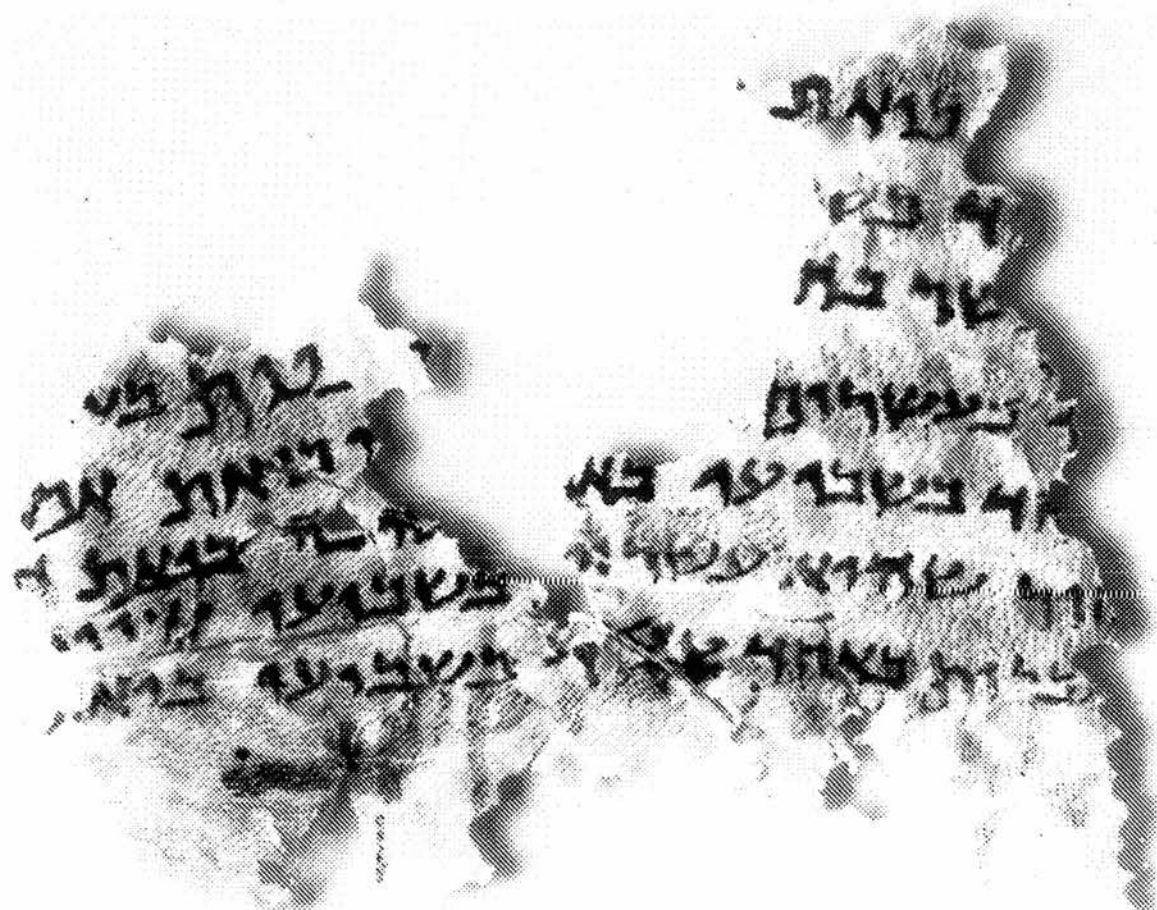


Fig. 1

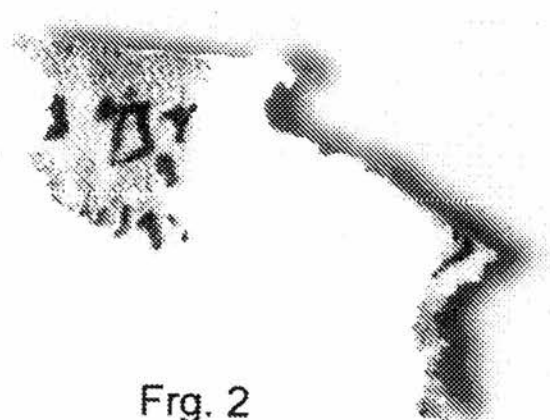


Fig. 2



Fig. 1



Fig. 3



Fig. 4

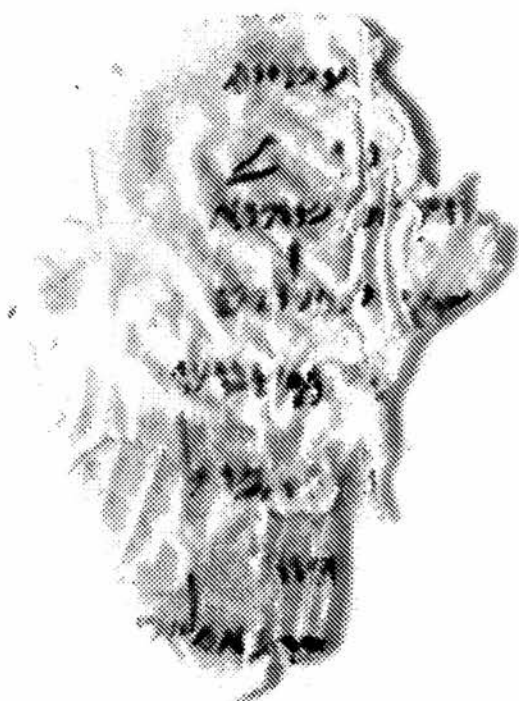


Fig. 2



Fig. 5

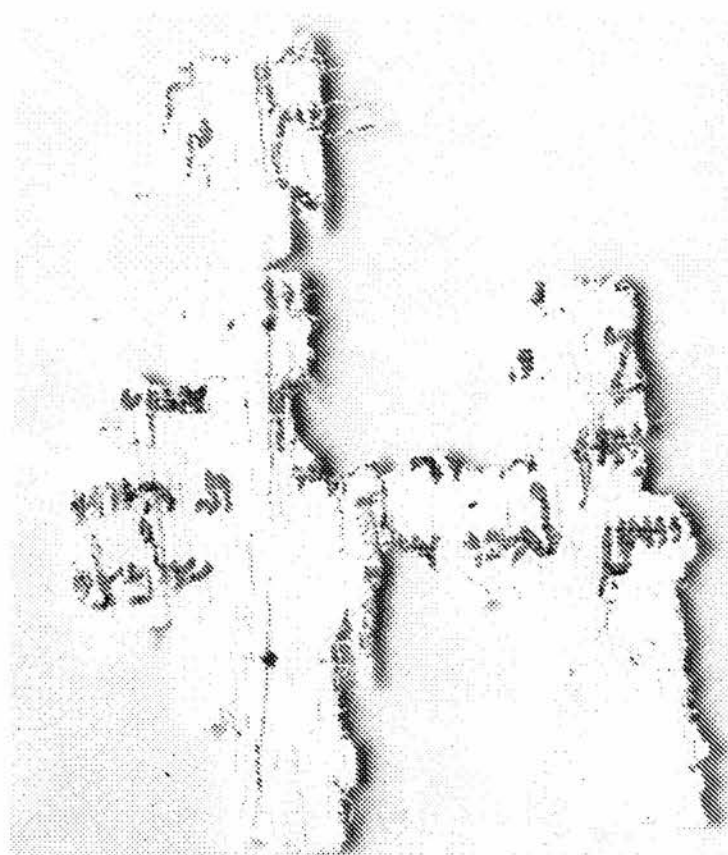


Fig. 1



Fig. 2

4Q324b



Frg. 5



Frg. 4



Frg. 3



Frg. 2



Frg. 1



Frg. 10



Frg. 9



Frg. 8



Frg. 7



Frg. 6



Frg. 11



Frg. 15



Frg. 14



Frg. 13



Frg. 12a

Frg. 12b



Frg. 20



Frg. 19



Frg. 18



Frg. 17



Frg. 16



Frg. 25



Frg. 24



Frg. 23



Frg. 22



Frg. 21



Frg. 31



Frg. 29



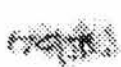
Frg. 28



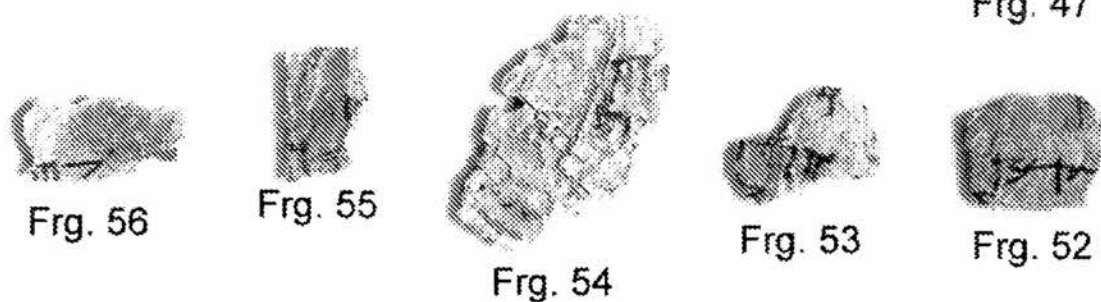
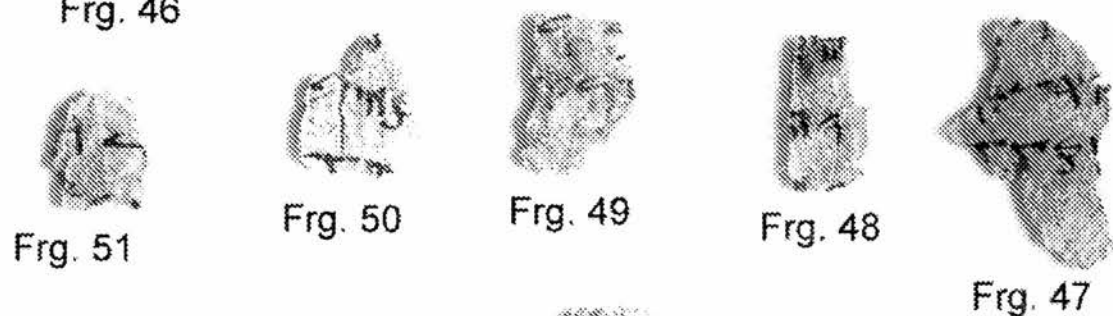
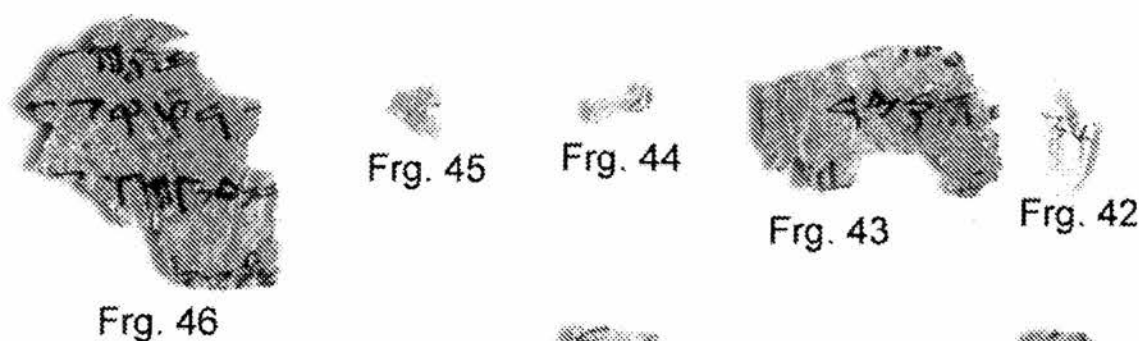
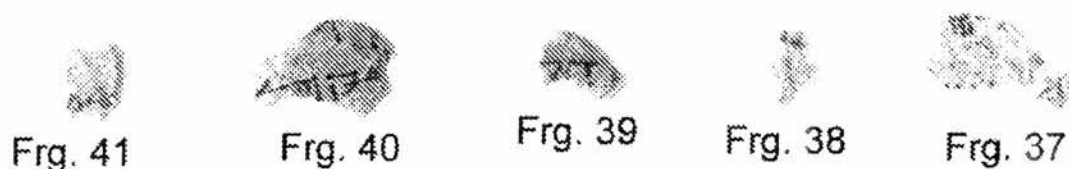
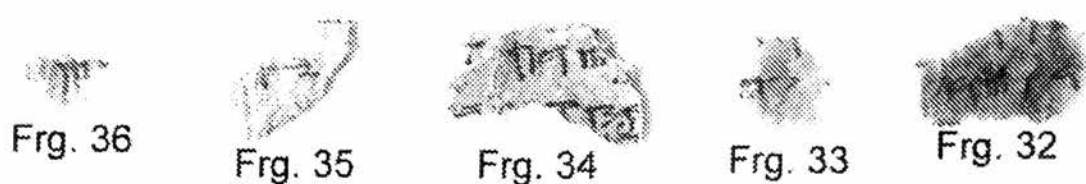
Frg. 27



Frg. 26



Frg. 30



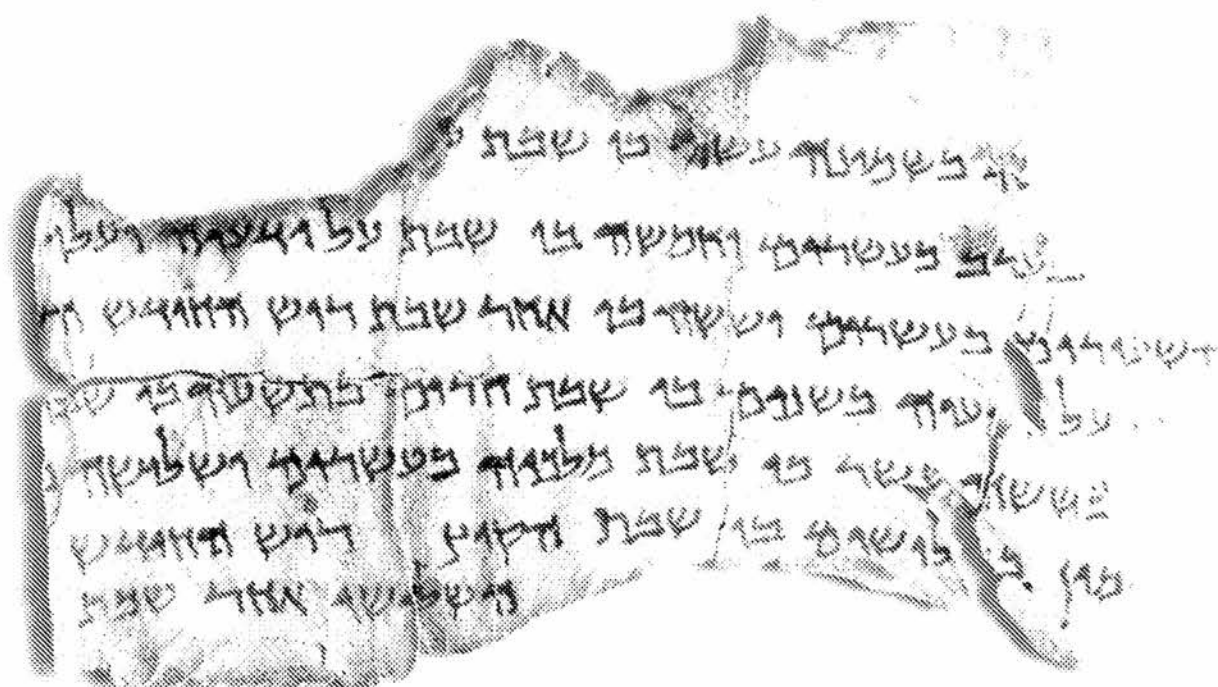


Fig. 1



Fig. 3

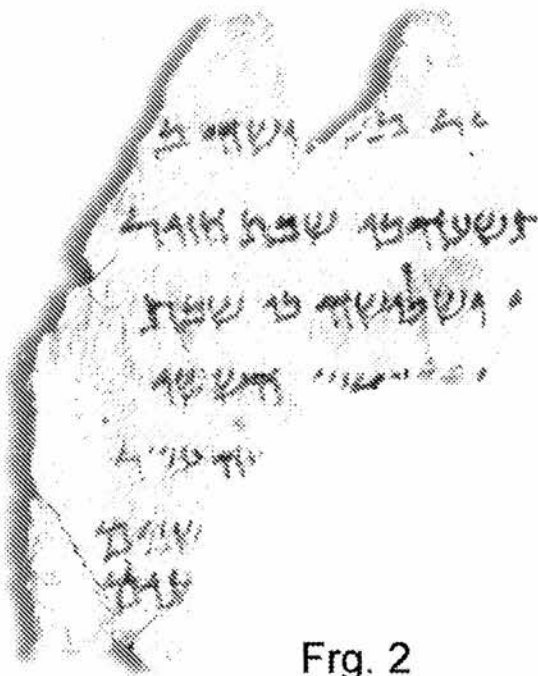
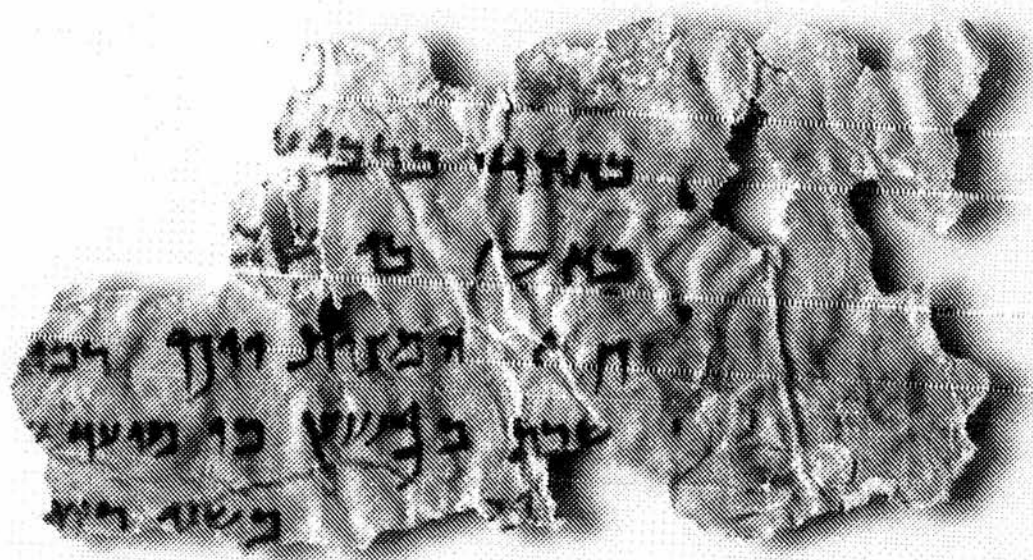
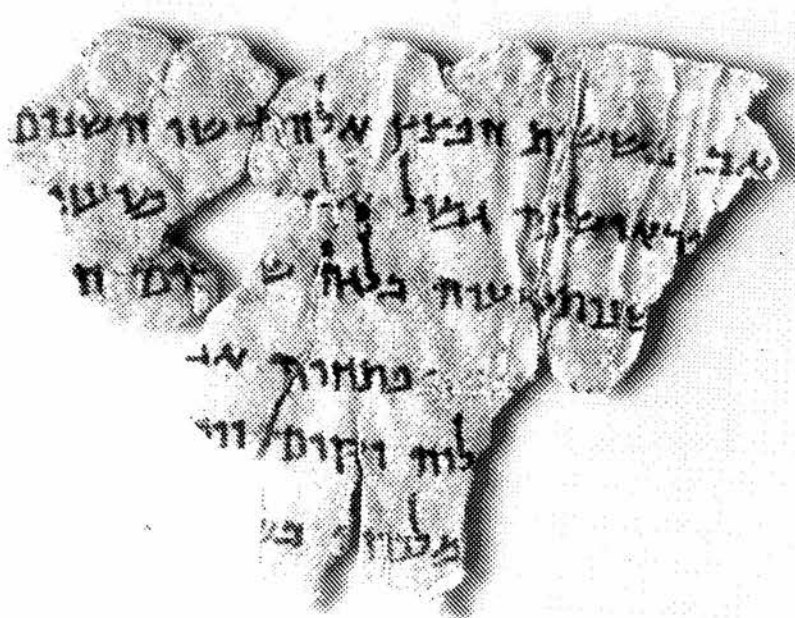


Fig. 2



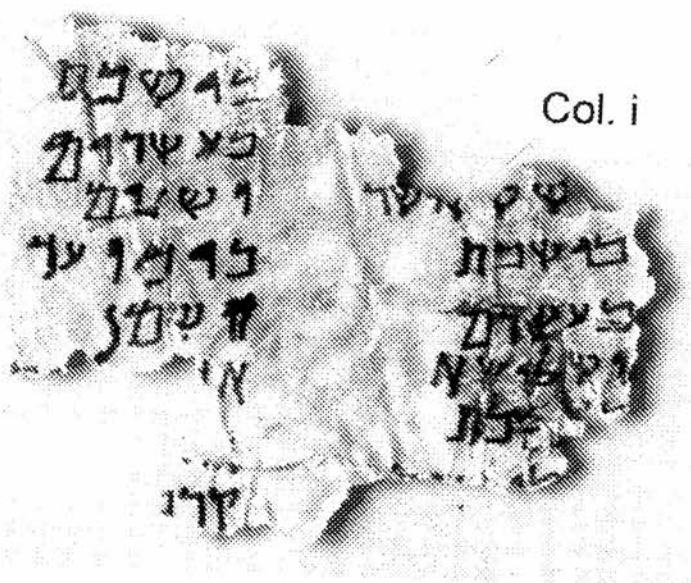
4Q326



4Q328

Col. ii

Col. i

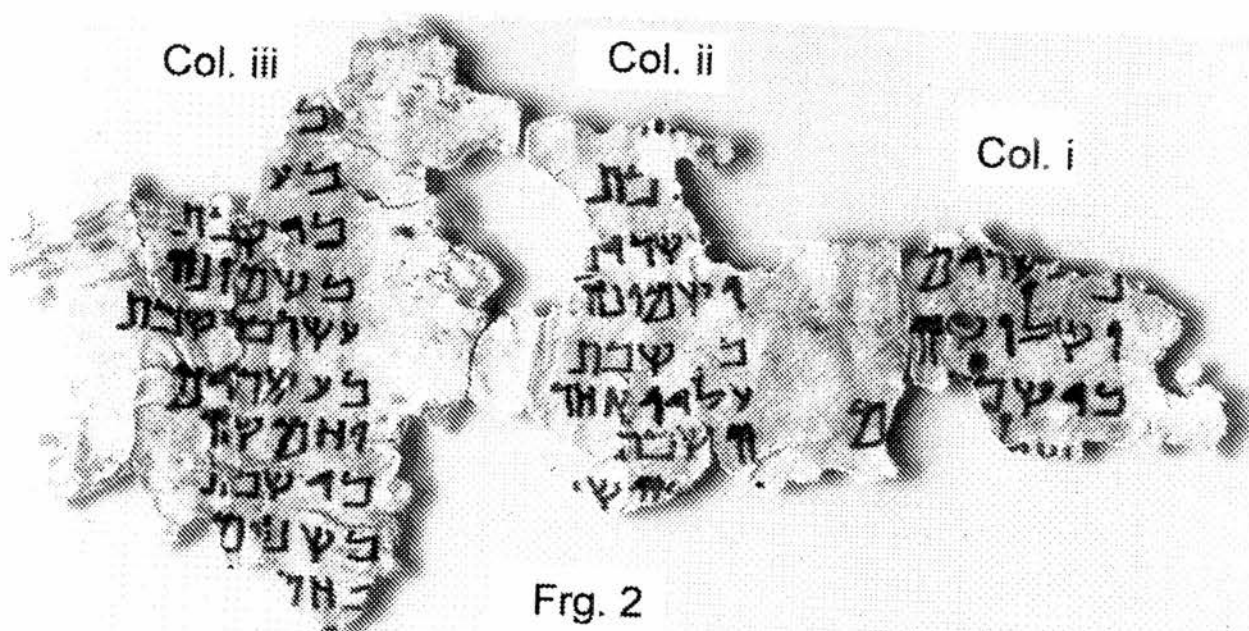


Frg. 1

Col. iii

Col. ii

Col. i



Frg. 2

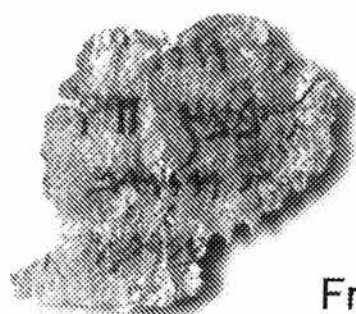


Fig. 1



4Q329

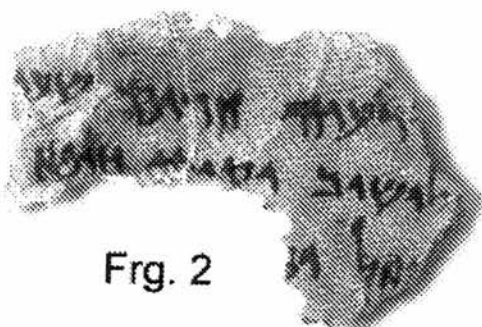


Fig. 2



4Q329a



Fig. 3



Fig. 1



Fig. 2

4Q330